L9 ANSWER 10 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1995:789087 CAPLUS
DOCUMENT NUMBER: 123:193493
TITLE: Characterization of starch-hydrolyzing lactic acid bacteria isolated from a fermented fish and rice food, "burong isda", and its amylolytic enzyme
AUTHOR(S): Olympia, Minerva; Fukuda, Hajime; Ono, Hisayo; Kaneko, Yoshinobu; Takano, Mitsuo
CORPORATE SOURCE: College Fisheries, Univ. Philippines in the Visayas Miagao, Iloilo, 5023, Philippines
SOURCE: Journal of Fermentation and Bioengineering (1995), 80(2), 124-30
CODEN: JFBIEX; ISSN: 0922-338X
PUBLISHER: Society for Fermentation and Bioengineering, Japan
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Nine strains of lactic acid bacteria that hydrolyze starch were isolated from burong isda, an indigenous fermented food made from fish and rice in the Philippines. Conventional taxonomic and DNA-DNA reassocn. studies indicated that all these isolates belong to Lactobacillus plantarum. Each of these isolates harbored more than ten plasmid species with mol. sizes of 2 to 60 kb. The amylolytic activity of L137, one of the isolates, was lost by treatment with novobiocin at 43% frequency, concomitant with curing of a 33-kb plasmid, pLTK13; this suggested that pLTK13 carries a gene necessary for synthesis of amylolytic enzyme. An acidophilic starch-hydrolyzing enzyme secreted from L137 cells was purified 46-fold with specific activity of 44 units per mg protein. The enzyme was shown to have a mol. mass of about 230 kDa and the optimum temperature and pH for the enzyme reaction with soluble starch were 35°C and 3.8-4.0, resp. The enzyme hydrolyzed soluble starch, amylopectin, glycogen, and pullulan, and to a small extent amylose, while it exerted no activity on dextran and cyclodextrins. The major reaction products from soluble starch were maltotriose, maltotetraose and maltopentaose, but no panose was detected, and maltotriose was the sole product from pullulan. The Km values for soluble starch, pullulan, and amylose were 4.0, 5.1, and 33 g per L, resp. These observations suggest that this enzyme hydrolyzes both α-1,6- and α-1,4-glucosidic linkages.

L9 ANSWER 11 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:423551 CAPLUS
DOCUMENT NUMBER: 119:23551
TITLE: Structure of the gene encoding cyclomaltodextrinase from Clostridium thermohydrosulfuricum 39E and characterization of the enzyme purified from Escherichia coli
AUTHOR(S): Podkovyrov, Sergey M.; Zeikus, J. Gregory
CORPORATE SOURCE: Dep. Biochem., Michigan State Univ., East Lansing, MI, 48824, USA
SOURCE: Journal of Bacteriology (1992), 174(16), 5400-5
CODEN: JOBAAY; ISSN: 0021-9193
DOCUMENT TYPE: Journal
LANGUAGE: English
AB C. thermohydrosulfuricum 39E, a gram-pos. thermophilic anaerobic bacterium, produced a cyclodextrin (CD)-degrading enzyme, cyclodextrinase (CDase) (EC 3.2.1.54). The enzyme was purified to homogeneity from Escherichia coli cells carrying a recombinant multicopy plasmid that contained the gene encoding for thermophilic CDase. The purified enzyme was a monomer with an Mr of 66,000 ± 2,000. It showed the highest activity at pH 5.9 and 65°. The enzyme hydrolyzed α-, β-, and γ-CD and linear maltooligosaccharides to yield maltose and glucose. The Km values for α-, β-, and γ-CD were 2.5, 2.1, and 1.3 mM, resp. The

rates of hydrolysis for polysaccharides (starch, amylose, amylopectin, and pullulan) were less than 5% of the rate of hydrolysis for α-CD. The entire nucleotide sequence of the CDase gene was determined The deduced amino acid sequence of CDase, consisting of 574 amino acids, showed some similarities with those of various amylolytic enzymes.

L9 ANSWER 12 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:175843 CAPLUS
DOCUMENT NUMBER: 118:175843
TITLE: Sugar-coated tablets containing intestinal bacteria and stabilizers
INVENTOR(S): Okamoto, Shizuo; Tanaka, Terukazu; Myamoto, Kazuo; Makita, Hirokazu
PATENT ASSIGNEE(S): Dainippon Pharmaceutical Co, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05004926	A2	19930114	JP 1991-183334	19910627

PRIORITY APPLN. INFO.: JP 1991-183334 19910627

AB Sugar-coated tablets contain useful intestinal bacteria and stabilizers chosen from poly(vinylpyrrolidone), Na CM-cellulose, poly(acrylic acid) Na salt, and Na alginate. Granules containing lactose 70, corn starch 30, CM-cellulose Ca 5, and PVP K30 5 mg were mixed with Streptococcus faecalis-containing powder 5, PVP K30 5, crystalline cellulose 7.5, Mg stearate 2, and SiO2 0.5 mg and made into tablets. The tablets were coated with 1:1 H2O-EtOH solution containing 4.5 mg hydroxypropyl Me cellulose, overcoated with a composition containing pullulan 1.5, PEP-101 (polyoxyethylene-polyoxypropylene glycol) 1, sucrose 42.14, talc 15.6, and TiO2 5.2 mg, and polished with 0.06 mg carnauba wax to give tablets. The tablets (containing 1.4 + 108 viable cells/g) were kept at 40° for 3 mo to show 1.2 + 108 viable cells/g, vs. 1.1 + 105 cells/g, for control tablets formulated without PVP K30.

L9 ANSWER 13 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1990:494497 CAPLUS
DOCUMENT NUMBER: 113:94497
TITLE: Thermostable amylase from an aerobic, Gram-negative, nonspore-forming thermophilic bacterium
AUTHOR(S): Sunna, Anwar; Hashwa, Fuad
CORPORATE SOURCE: Dep. Biol. Sci., Univ. Jordan, Amman, Jordan
SOURCE: Biotechnology Letters (1990), 12(6), 433-8
CODEN: BILED3; ISSN: 0141-5492
DOCUMENT TYPE: Journal
LANGUAGE: English

AB An obligate aerobic, rod-shaped, Gram-neg., nonspore-forming thermophilic bacterium was isolated from soil on starch nutrient agar at 60°. Starch, dextrin, maltose, and pullulan induced the synthesis of amylase, while glucose, lactose, and fructose did not. The formation of heat-stable amylase started in the early exponential phase, while maximum extracellular enzyme activity (21.75 U/mL) was detected at the end of the decline phase when most of the cells appeared as spheres.

L9 ANSWER 14 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1975:591366 CAPLUS
DOCUMENT NUMBER: 83:191366

TITLE: Successive purification of pullulan
INVENTOR(S): Kato, Koso; Nomura, Tatsuo
PATENT ASSIGNEE(S): Hayashibara Biochemical Laboratories, Inc., Japan
SOURCE: Ger. Offen., 13 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 2507563	A1	19750828	DE 1975-2507563	19750221
JP 50116692	A2	19750912	JP 1974-21783	19740223
JP 54014678	B4	19790608		
US 3959009	A	19760525	US 1975-550028	19750214
GB 1459066	A	19761222	GB 1975-7207	19750220
FR 2262109	A1	19750919	FR 1975-5409	19750221
FR 2262109	B1	19781006		
CA 1029016	A1	19780404	CA 1975-220549	19750221

PRIORITY APPLN. INFO.: JP 1974-21783 A 19740223

AB Pullulan [9057-02-7] is separated from bacterial culture, purified by contact with a series of organic solvent solns. of different concns., and dried. Thus, Aureobasidium pullulans was cultured in a standard medium, the cells were removed, and the liquid was dried. The powder was suspended in water to a concentration of 21 g pullulan/100 ml and sprayed into a tank containing 1000 l. 80% MeOH [67-56-1]. This yielded a fine suspension of pullulan in the MeOH solution The suspension was then pumped into a hydrocyclone which concentrated the suspension and removed excess solvent, and the suspension was then sent to a tank containing 1000 l. of 90% MeOH. The process was repeated with a 3rd tank containing 1000 l. 97% MeOH. The final suspension was centrifuged and the precipitate dried to yield a powder containing 5% water and 0.1% contaminating sugars.

L9 ANSWER 15 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1970:443929 CAPLUS
DOCUMENT NUMBER: 73:43929
TITLE: Production of bacterial α-1,6-glucosidases
INVENTOR(S): Sugimoto, Kaname; Hirao, Mamoru; Masuda, Kazuo; Sakai, Shuzo
PATENT ASSIGNEE(S): Hayashibara Co., Ltd.
SOURCE: Fr. Demande, 15 pp.
CODEN: FRXXBL
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2005304	A5	19691212	FR 1969-9811	19690401
FR 2005304	B1	19750801		
JP 56039630	B4	19810914	JP 1968-21364	19680401
IL 31914	A1	19730730	IL 1969-31914	19690326
NL 6904916	A	19691003	NL 1969-4916	19690331
NL 162691	C	19800616		
NL 162691	B	19800115		
CH 507368	A	19710515	CH 1969-507368	19690331
BE 730844	A	19691001	BE 1969-730844	19690401
GB 1260418	A	19720119	GB 1969-1260418	19690401
SU 469267	D	19750430	SU 1969-1838524	19690401
US 3827940	A	19740806	US 1972-237578	19720323

SU 545267 D 19770130 SU 1972-1838523 19721019
PRIORITY APPLN. INFO.: JP 1968-21364 A 19680401
US 1969-810293 A1 19690325

AB α-1,6-Glucosidases are prepared by cultivation of bacteria in media containing a N source, such as peptone, yeast extract, and (or) urea, and a C source, such as liquefied starch and (or) maltose. Thus, Micrococcus lysodeikticus was grown in a liquid medium containing maltose 1, peptone 0.5, yeast extract 0.25, urea 0.2, meat extract 0.2, K2HPO4 0.1, KCl 0.05, and MgSO4.7H2O 0.05% at 30° with stirring and aeration. From the culture fluid and the cells, an enzyme preparation was isolated which showed in the degradation of potato starch, rice starch, β-dextrin, dextran, glycogen, and pullulan a relative activity of 89 (?), 78, 84, 1.5, 35, and 115, resp. Enzyme prepns. from Lactobacillus, Nocardia, and a variety of other bacteria may be produced similarly.

L9 ANSWER 16 OF 22 MEDLINE on STN
ACCESSION NUMBER: 2004063726 MEDLINE
DOCUMENT NUMBER: PubMed ID: 14764935
TITLE: Cloning of the thermostable alpha-amylase gene from Pyrococcus woesei in Escherichia coli: isolation and some properties of the enzyme.
AUTHOR: Grzybowska Beata; Szweda Piotr; Synowiecki Jozef
CORPORATE SOURCE: Department of Food Chemistry and Technology, Gdansk University of Technology, ul. Gabriela Narutowicza 11/12, 80-952 Gdansk, Poland.
SOURCE: Molecular biotechnology, (2004 Feb) Vol. 26, No. 2, pp. 101-10.
Journal code: 9423533. ISSN: 1073-6085.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200410
ENTRY DATE: Entered STN: 7 Feb 2004
Last Updated on STN: 6 Oct 2004
Entered Medline: 5 Oct 2004

AB Pyrococcus woesei (DSM 3773) alpha-amylase gene was cloned into pET21d(+) and pYTB2 plasmids, and the pET21d(+)alpha-amyl and pYTB2alpha-amyl vectors obtained were used for expression of thermostable alpha-amylase or fusion of alpha-amylase and intein in Escherichia coli BL21(DE3) or BL21(DE3)pLysS cells, respectively. As compared with other expression systems, the synthesis of alpha-amylase in fusion with intein in E. coli BL21(DE3)pLysS strain led to a lower level of inclusion bodies formation-they exhibit only 35% of total cell activity-and high productivity of the soluble enzyme form (195,000 U/L of the growth medium). The thermostable alpha-amylase can be purified free of most of the bacterial protein and released from fusion with intein by heat treatment at about 75 degrees C in the presence of thiol compounds. The recombinant enzyme has maximal activity at pH 5.6 and 95 degrees C. The half-life of this preparation in 0.05 M acetate buffer (pH 5.6) at 90 degrees C and 110 degrees C was 11 h and 3.5 h, respectively, and retained 24% of residual activity following incubation for 2 h at 120 degrees C. Maltose was the main end product of starch hydrolysis catalyzed by this alpha-amylase. However, small amounts of glucose and some residual unconverted oligosaccharides were also detected. Furthermore, this enzyme shows remarkable activity toward glycogen (49.9% of the value determined for starch hydrolysis) but not toward pullulan.

L9 ANSWER 17 OF 22 MEDLINE on STN
ACCESSION NUMBER: 2002146724 MEDLINE
DOCUMENT NUMBER: PubMed ID: 11880397
TITLE: Streptococcus sinensis sp. nov., a novel species isolated from a patient with infective endocarditis.

AUTHOR: Woo Patrick C Y; Tam Dorothy M W; Leung Kit-Wah; Lau Susanna K P; Teng Jade L L; Wong Michelle K M; Yuen Kwok-Yung
CORPORATE SOURCE: Department of Microbiology, The University of Hong Kong, Queen Mary Hospital HKU-Pasteur Research Centre, Hong Kong.
SOURCE: Journal of clinical microbiology, (2002 Mar) Vol. 40, No. 3, pp. 805-10.
Journal code: 7505564. ISSN: 0095-1137.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AY049738
ENTRY MONTH: 200204
ENTRY DATE: Entered STN: 7 Mar 2002
Last Updated on STN: 19 Apr 2002
Entered Medline: 18 Apr 2002

AB A bacterium was isolated from the blood culture of a patient with infective endocarditis. The cells were facultative anaerobic, nonsporulating, gram-positive cocci arranged in chains. The bacterium grows on sheep blood agar as alpha-hemolytic, gray colonies of 0.5 to 1 mm in diameter after 24 h of incubation at 37 degrees C in ambient air. Growth also occurs in 10 or 40% bile and on bile esculin agar but not in 6% NaCl. No enhancement of growth is observed in 5% CO(2). It is nongroupable with Lancefield groups A, B, C, D, F, or G antisera and is resistant to optochin and bacitracin. The organism is aflagellated and is nonmotile at both 25 and 37 degrees C. It is Voges-Proskauer test positive. It produces leucine arylamidase and beta-glucosidase but not catalase, urease, lysine decarboxylase, or ornithine decarboxylase. It hydrolyzes esculin and arginine. It utilizes glucose, lactose, salicin, sucrose, pullulan, trehalose, cellobiose, hemicellulase, mannose, maltose, and starch. 16S rRNA gene sequencing showed that there were 3.6, 3.7, 4.3, 4.7, and 5.9% differences between the 16S rRNA gene sequence of the bacterium and those of Streptococcus gordonii, Streptococcus intermedius, Streptococcus constellatus, Streptococcus sanguis, and Streptococcus anginosus, respectively. The G+C content of it (mean plus minus standard deviation) was 53.0% plus minus 2.9%. Based on phylogenetic affiliation, it belongs to the mitis or anginosus group of Streptococcus. For these reasons a new species, Streptococcus sinensis sp. nov., is proposed, for which HKU4 is the type strain. Further studies should be performed to ascertain the potential of this bacterium to become an emerging cause of infective endocarditis.

L9 ANSWER 18 OF 22 MEDLINE on STN
ACCESSION NUMBER: 2001445122 MEDLINE
DOCUMENT NUMBER: PubMed ID: 11491356
TITLE: Thermoanaerobacter yonseiensis sp. nov., a novel extremely thermophilic, xylose-utilizing bacterium that grows at up to 85 degrees C.
AUTHOR: Kim B C; Grote R; Lee D W; Antranikian G; Pyun Y R
CORPORATE SOURCE: Department of Biotechnology and Bioproducts Research Center, Yonsei University, Seoul, Korea.
SOURCE: International journal of systematic and evolutionary microbiology, (2001 Jul) Vol. 51, No. Pt 4, pp. 1539-48.
Journal code: 100899600. ISSN: 1466-5026.
PUB. COUNTRY: England: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AF212925
ENTRY MONTH: 200112
ENTRY DATE: Entered STN: 13 Aug 2001
Last Updated on STN: 21 Jan 2002

Entered Medline: 4 Dec 2001

AB A novel strictly anaerobic, extremely thermophilic, spore-forming and xylose-utilizing bacterium, designated strain KB-1TP (type and patent strain), was isolated from a geothermal hot stream at Sileri on Java island, Indonesia. The cells were rod-shaped, motile and had terminal spores. The newly isolated strain stained gram-positive and the cells occurred singly or in pairs during the exponential growth phase. The temperature optimum for growth was 75 degrees C and growth occurred in the range 50-85 degrees C. The pH range for growth was 4.5-9.0, with an optimum at pH 6.5. Strain KB-1TP grew chemo-organotrophically by fermenting a wide range of substrates such as glucose, fructose, D-xylose, lactose, maltose, sucrose, mannose, galactose, cellobiose, pullulan and soluble starch. Arabinose, xylan, cellulose, olive oil and Tween 80 were not fermented. The predominant fermentation end products after growth on glucose were lactate, acetate, ethanol, CO2 and small amounts of isovaleric acid, butyric acid, propionic acid, 1-pentanol and 2-propanol. Thiosulfate was reduced to H2S. Strain KB-1TP was sensitive to tetracycline, chloramphenicol, penicillin G, neomycin, kanamycin, vancomycin and rifampicin at concentrations of 100 microg ml(-1). No effect was observed with chloramphenicol and neomycin at concentrations of 10 microg ml(-1). This indicates that strain KB-1TP belongs to the bacterial domain. The G+C content of the DNA was 37 mol%. The comparison of the 165 rDNA sequence to that of closely related strains revealed that strain KB-1TP belonged to clostridial cluster V, showing highest sequence identities (92.7%) to members of the genus Thermoanaerobacter. Taking into account the physiological and molecular properties of the new isolate, it is proposed that strain KB-1TP should be classified as a new species of the genus Thermoanaerobacter, designated Thermoanaerobacter yonseiensis. The type strain, KB-1TP, has been deposited in the Korean Federation of Culture Collections (KFCC 11116P) as a patent strain and in the Deutsche Sammlung von Mikroorganismen und Zellkulturen as a type strain (= DSM 13777T).

L9 ANSWER 19 OF 22 MEDLINE on STN

ACCESSION NUMBER: 2001260521 MEDLINE
DOCUMENT NUMBER: PubMed ID: 11321091
TITLE: Anaerobranca gottschalkii sp. nov., a novel thermoalkaliphilic bacterium that grows anaerobically at high pH and temperature.
AUTHOR: Prowe S G; Antranikian G
CORPORATE SOURCE: Institute of Technical Microbiology, Technical University Hamburg-Harburg, Germany.
SOURCE: International journal of systematic and evolutionary microbiology, (2001 Mar) Vol. 51, No. Pt 2, pp. 457-65. Journal code: 100899600. ISSN: 1466-5026.
PUB. COUNTRY: England: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AF203703
ENTRY MONTH: 200105
ENTRY DATE: Entered STN: 21 May 2001
Last Updated on STN: 21 May 2001
Entered Medline: 17 May 2001

AB A novel thermoalkaliphilic, obligately anaerobic bacterium was isolated from a humid soil sample of a hot inlet of Lake Bogoria, Kenya. The newly isolated strain grows optimally at pH 9.5 and 50-55 degrees C and its growth range is pH 6.0-10.5 and 30-65 degrees C. Unlike the already known thermoalkaliphiles, the strain grows heterotrophically on a variety of mono- and polysaccharides (glucose, ribose, mannose, fructose, sucrose, maltose, starch, pullulan, xylan and cellulose) and on proteinaceous substrates such as yeast extract, peptone and tryptone. No dissimilatory sulfate reduction was observed, whereas thiosulfate was

found to enhance growth when glucose or starch were used as substrates. Under optimal conditions, the doubling time is 48 min. Sodium ions are necessary for growth, with an optimal concentration of 230 mM (1% NaCl, w/v) at pH 9.5. The rod-shaped cells are motile in the exponential growth phase under optimal growth conditions. Despite the Gram-negative staining and negative KOH assay, the strain is a Gram-positive organism, having an atypically thin cell wall. A sheath-like structure occurs at the cell separation area and parts of a surface layer-like structure were also observed. Based on physiological properties and molecular biological analysis, the strain falls within the radiation of the clostridia and represents a new species of Anaerobranca within the Clostridium/Bacillus subphylum of the Gram-positive bacteria. Strain LBS3T (= DSM 13577T) is named Anaerobranca gottschalkii sp. nov. and is designated as the type strain.

L9 ANSWER 20 OF 22 MEDLINE on STN
ACCESSION NUMBER: 2000117797 MEDLINE
DOCUMENT NUMBER: PubMed ID: 10650202
TITLE: Gene cloning, nucleotide sequence and biochemical properties of a cytoplasmic cyclomaltodextrinase (neopullulanase) from Alicyclobacillus acidocaldarius, reclassification of a group of enzymes.
AUTHOR: Matzke J; Herrmann A; Schneider E; Bakker E P
CORPORATE SOURCE: Abteilung Mikrobiologie, Universitat Osnabruck, Barbarastasse 11, D-49069, Osnabruck, Germany.
SOURCE: FEMS microbiology letters, (2000 Feb 1) Vol. 183, No. 1, pp. 55-61.
Journal code: 7705721. ISSN: 0378-1097.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AJ133789
ENTRY MONTH: 200003
ENTRY DATE: Entered STN: 20 Mar 2000
Last Updated on STN: 19 Oct 2000
Entered Medline: 7 Mar 2000

AB A gene encoding a cyclomaltodextrinase (neopullulanase) was cloned from the thermoacidophilic bacterium Alicyclobacillus acidocaldarius ATCC27009 and its nucleotide sequence was determined. The encoded CdaA protein lacked an N-terminal signal sequence and aligned well with a family of bacterial proteins described as maltogenic alpha-amylases, neopullulanases or cyclomaltodextrinases. Escherichia coli cells harboring the cloned cdaA gene produced a 66-kDa protein that degraded pullulan in a sodium dodecyl sulfate-polyacrylamide gel. A. acidocaldarius cells grown on maltose, soluble starch or pullulan synthesized the same protein. Neopullulanase activity of the protein was cytoplasmic and its pH optimum of 5.5 was close to the pH value of the cytoplasm. CdaA degraded cyclomaltodextrins rapidly and pullulan (to panose) more slowly. It is proposed that CdaA functions as a cytoplasmic cyclomaltodextrinase (EC 3.2.1.54).

L9 ANSWER 21 OF 22 MEDLINE on STN
ACCESSION NUMBER: 92355516 MEDLINE
DOCUMENT NUMBER: PubMed ID: 1644767
TITLE: Structure of the gene encoding cyclomaltodextrinase from Clostridium thermohydrosulfuricum 39E and characterization of the enzyme purified from Escherichia coli.
AUTHOR: Podkovyrov S M; Zeikus J G
CORPORATE SOURCE: Department of Biochemistry, Michigan State University, East Lansing 48824.
SOURCE: Journal of bacteriology, (1992 Aug) Vol. 174, No. 16, pp. 5400-5.

Journal code: 2985120R. ISSN: 0021-9193.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-M88602; GENBANK-M90093; GENBANK-M94059; GENBANK-M94060; GENBANK-M94061; GENBANK-M94062; GENBANK-X64378; GENBANK-X64379; GENBANK-X64380; GENBANK-X64381
ENTRY MONTH: 199209
ENTRY DATE: Entered STN: 25 Sep 1992
Last Updated on STN: 25 Sep 1992
Entered Medline: 8 Sep 1992

AB Clostridium thermohydrosulfuricum 39E, a gram-positive thermophilic anaerobic bacterium, produced a cyclodextrin (CD)-degrading enzyme, cyclodextrinase (CDase) (EC 3.2.1.54). The enzyme was purified to homogeneity from Escherichia coli cells carrying a recombinant multicopy plasmid that contained the gene encoding for thermophilic CDase. The purified enzyme was a monomer with an M(r) of 66,000 +/- 2,000. It showed the highest activity at pH 5.9 and 65 degrees C. The enzyme hydrolyzed alpha-, beta-, and gamma-CD and linear maltooligosaccharides to yield maltose and glucose. The Km values for alpha-, beta-, and gamma-CD were 2.5, 2.1, and 1.3 mM, respectively. The rates of hydrolysis for polysaccharides (starch, amylose, amylopectin, and pullulan) were less than 5% of the rate of hydrolysis for alpha-CD. The entire nucleotide sequence of the CDase gene was determined. The deduced amino acid sequence of CDase, consisting of 574 amino acids, showed some similarities with those of various amylolytic enzymes.

L9 ANSWER 22 OF 22 MEDLINE on STN
ACCESSION NUMBER: 91027540 MEDLINE
DOCUMENT NUMBER: PubMed ID: 2223604
TITLE: Description of Bacillus naganoensis sp. nov.
AUTHOR: Tomimura E; Zeman N W; Frankiewicz J R; Teague W M
CORPORATE SOURCE: Enzyme Bio-Systems Ltd., Arlington Heights, Illinois 60005.
SOURCE: International journal of systematic bacteriology, (1990 Apr) Vol. 40, No. 2, pp. 123-5.
Journal code: 0042143. ISSN: 0020-7713.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199012
ENTRY DATE: Entered STN: 8 Feb 1991
Last Updated on STN: 8 Feb 1991
Entered Medline: 10 Dec 1990

AB A new species, Bacillus naganoensis, is proposed for an obligately aerobic, moderately acidophilic, endospore-forming bacterium that produces a thermostable, aciduric pullulanase (EC 3.2.1.41). The organism was isolated from soil by selection on solid, pullulan -containing medium at pH 4.0 and 30 degrees C. The isolate required a medium pH of less than 6.5 for growth initiation. Fatty acid composition studies revealed that the major fatty acid of cells grown in nutrient broth supplemented with 1% starch was 14-methylpentadecanoic acid (iso-C16) at 45 mol%. The guanine-plus-cytosine content of the DNA of this organism was 45 +/- 2 mol%. A type culture has been deposited with the American Type Culture Collection, Rockville, Md., as strain ATCC 53909.

L9 ANSWER 1 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2006:902408 CAPLUS
TITLE: Molecular nuclear imaging for targeting and trafficking
AUTHOR(S): Bom, Hee-Seung; Min, Jung-Jun; Jeong, Hwan-Jeong
CORPORATE SOURCE: Department of Nuclear Medicine, Chonnam National University, Gwangju, S. Korea
SOURCE: Nuclear Engineering and Technology (2006), 38(5, Spec. Issue), 399-404
CODEN: NETUAM; ISSN: 1738-5733
PUBLISHER: Korean Nuclear Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Noninvasive mol. targeting in living subjects is highly demanded for better understanding of such diverse topics as the efficient delivery of drugs, genes, or radionuclides for the diagnosis or treatment of diseases. Progress in mol. biol., genetic engineering and polymer chemical provides various tools to target mols. and cells in vivo. We used chitosan as a polymer, and 99mTc as a radionuclide. We developed 99mTc-galactosylated chitosan to target asialoglycoprotein receptors for nuclear imaging. We also developed 99mTc-HYNIC-chitosan-transferrin to target inflammatory cells, which was more effective than 67Ga-citrate for imaging inflammatory lesions. For an effective delivery of mols., a longer circulation time is needed. We found that around 10% PEGylation was most effective to prolong the circulation time of liposomes for nuclear imaging of 99mTc-HMPAO-labeled liposomes in rats. Using various characteristics of mols., we can deliver drugs into targets more effectively. We found that 99mTc-labeled biodegradable pullulan -derivs. are retained in tumor tissue in response to extracellular ion-strength. For the trafficking of various cells or bacteria in an intact animal, we used optical imaging techniques or radiolabeled cells. We monitored tumor-targeting bacteria by bioluminescent imaging techniques, dendritic cells by radiolabeling and neuronal stem cells by sodium-iodide symporter reporter gene imaging. In summary, we introduced recent achievements of mol. nuclear imaging technologies in targeting receptors for hepatocyte or inflammatory cells and in trafficking bacterial, immune and stem cells using mol. nuclear imaging techniques.
REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 2 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:1169492 CAPLUS
DOCUMENT NUMBER: 144:329819
TITLE: Dextransucrase production by Leuconostoc mesenteroides
AUTHOR(S): Purama, Ravi Kiran; Goyal, Arun
CORPORATE SOURCE: Department of Biotechnology, Indian Institute of Technology Guwahati, Assam, 781 039, India
SOURCE: Indian Journal of Microbiology (2005), 45(2), 89-101
CODEN: IJMBAC; ISSN: 0046-8991
PUBLISHER: Association of Microbiologists of India
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English
AB A review. Microbes produce an array of exopolysaccharides which form a biofilm around the cells facilitating attachment of the cells to surface, colonization and providing protection against unfavorable conditions. Xanthan, alginate, pullulan, dextran, alternan, levan and inulan are some of the examples. Dextran, alternan, levan and inulan are produced by a group of bacteria belonging to Lactobacillus family. These compds. are derived from sucrose derivs. like glucose and fructose, where glucose gets polymerized to dextran while fructose is used as energy source by the exocellular or cell membrane

bound enzymes. The gram-pos. Leuconostoc mesenteroides NRRL B-512F, which synthesizes the extracellular homopolysaccharide dextran, is an extensively used organism for the industrial production of dextransucrase. Dextran gained importance owing to its applications in the pharmaceutical, food, photo film manufacturing and fine chemical industries. The maintenance and production media composition and culture conditions have been optimized for the large scale production of dextransucrase. Low cost carbon and nitrogen sources like sugar-beet molasses, corn steep liquor and wheat bran extract have been successfully employed for large-scale preparation of dextransucrase by fermentation process. Mutants were developed and fermentation techniques like batch, semi-continuous fermentation by free and immobilized cells were tried to economize com. production of dextransucrase. Present communication reviews the available information on cultural conditions and nutritional requirements for the production of dextransucrase by Leuconostoc sp.

REFERENCE COUNT: 85 THERE ARE 85 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 3 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:1054464 CAPLUS
DOCUMENT NUMBER: 142:28175
TITLE: Bacterial cell preparations containing cells coated with water-soluble organic solvent- or fat-soluble coating agents and antibacterial agents
INVENTOR(S): Fukuda, Toshiaki; Mayumi, Etsuko; Miura, Takanori
PATENT ASSIGNEE(S): Taiko Pharmaceutical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004345999	A2	20041209	JP 2003-144117	20030521
PRIORITY APPLN. INFO.:			JP 2003-144117	20030521

AB Bacterial cell prepns., which supply beneficial intestinal bacteria cells to intestine and suppress growth of harmful bacteria, contain (a) bacterial cells coated with protecting agents which are water-soluble and insol. or poorly soluble in organic solvents or fats and oils and (b) antibacterial agents which are soluble in organic solvents or fats and oils. A com. Enterococcus faecium powder was added to PI 20 (an aqueous pullulan solution) containing glycerin, and the mixture was solidified into film upon drying, and ground to give pullulan-coated cell powder. The powder was exposed to 100% wood creosote for 1 h to show 105% survival of the cells, vs. 12% of uncoated cells.

L9 ANSWER 4 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:201918 CAPLUS
DOCUMENT NUMBER: 141:256326
TITLE: Cloning of the thermostable α-amylase gene from Pyrococcus woesei in Escherichia coli: isolation and some properties of the enzyme
AUTHOR(S): Grzybowska, Beata; Szweda, Piotr; Synowiecki, Jozef
CORPORATE SOURCE: USA
SOURCE: Molecular Biotechnology (2004), 26(2), 101-109
CODEN: MLBOEO; ISSN: 1073-6085
PUBLISHER: Humana Press Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Pyrococcus woesei (DSM 3773) α-amylase gene was cloned into

pET21d(+) and pYTB2 plasmids, and the pET21d(+)α-amyl and pYTB2α-amyl vectors obtained were used for expression of thermostable α-amylase or fusion of α-amylase and intein in Escherichia coli BL21(DE3) or BL21(DE3)pLysS cells, resp. As compared with other expression systems, the synthesis of α-amylase in fusion with intein in E. coli BL21(DE3)pLysS strain led to a lower level of inclusion body formation - they exhibit only 35% of total cell activity - and high productivity of the soluble enzyme form (195,000 U/L of the growth medium). The thermostable α-amylase can be purified free of most of the bacterial protein and released from fusion with intein by heat treatment at about 75° in the presence of thiol compds. The recombinant enzyme has maximal activity at pH 5.6 and 95°. The half-life of this preparation in 0.05 M acetate buffer (pH 5.6) at 90° and 110° was 11 h and 3.5 h, resp., and retained 24% of residual activity following incubation for 2 h at 120°. Maltose was the main end product of starch hydrolysis catalyzed by this α-amylase. However, small amts. of glucose and some residual unconverted oligosaccharides were also detected. Furthermore, this enzyme shows remarkable activity toward glycogen (49.9% of the value determined for starch hydrolysis) but not toward pullulan.

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 5 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:163880 CAPLUS

DOCUMENT NUMBER: 136:212588

TITLE: Enzymological studies on isomalto-dextranase from Arthrobacter globiformis

AUTHOR(S): Takayanagi, Tsutomu

CORPORATE SOURCE: The Inst. Enol. Viticulture, Yamanashi Univ., Kofu, 400-0005, Japan

SOURCE: Journal of Applied Glycoscience (2002), 49(1), 57-62
CODEN: JAGLFX; ISSN: 1344-7882

PUBLISHER: Japanese Society of Applied Glycoscience

DOCUMENT TYPE: Journal; General Review

LANGUAGE: Japanese

AB A review. Isomalto-dextranase (EC 3.2.1.94) was purified from the culture of a soil bacterium, Arthrobacter globiformis T 6 by successive chromatogs. on CM-cellulose and CM-sepharose to a homogeneous state as confirmed by PAGE. The mol. weight of the enzyme was estimated to be about 69 kDa by SDS-PAGE. The enzyme hydrolyzed α-1,6-glucosidic linkages of dextran or isomalto-oligosaccharides to release exolytically α-isomaltose from the non-reducing ends. The optimum pH and temperature of the enzyme were pH 5.3 and 65°, resp. The enzyme showed a weak isopullulanase activity, an endo-type attack on pullulan to produce isopanose. The isomalto-dextranase expressed by the recombinant E. coli cells also produced isopanose from pullulan.
The enzyme hydrolyzed α-1,4-glucosidic linkage of panose as well as α-1, 6-glucosidic linkage of isomaltotriose. The kinetic features of the expts. with the mixed substrates of isomaltotriose and panose were in good agreement with those expected for a single catalytic site mechanism. The ionization consts., pKe1, and pKe2, of the essential ionizable groups 1 and 2 of the enzyme were 3.3 and 6.3 for dextran T2000 and 3.5 and 6.1 for isomaltotriose. The heats of ionization for groups 1 and 2 were 0 kcal/mol or less with both the substrates. These kinetic results suggested that the ionizable groups essential for the enzyme activity were carboxyl and carboxylate. Modification expts. with 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide (EDC), modifying carboxyl residues specifically, also indicated that he carboxyl groups were essential to the enzyme activity. The subsite affinities of the enzyme were calculated to be >7.3, <-7.2, 6.7, 0.74 and 0.18 kcal/mol for subsites 1, 2, 3, 4, and 5, resp., from the rate parameters (Km and k0) for the hydrolysis of isomaltooligosaccharides. Subsites 1 and 3, showing large affinity values, were thought to attract the substrates and form the

productive bindings. A new method for preparation of isomaltose was developed by using the enzyme and an acid-treated dextran. The branch points of dextran were selectively hydrolyzed by a mild acid pretreatment. When the acid-treated dextran was acted by the enzyme, the maximum degree of hydrolysis went up to over 90%.

L9 ANSWER 6 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:600611 CAPLUS
DOCUMENT NUMBER: 135:329174
TITLE: Thermoanaerobacter yonseiensis sp. nov., a novel extremely thermophilic, xylose-utilizing bacterium that grows at up to 85 °C
AUTHOR(S): Kim, Byoung-Chan; Grote, Ralf; Lee, Dong-Woo; Antranikian, Garabed; Pyun, Yu-Ryang
CORPORATE SOURCE: Department of Biotechnology and Bioproducts Research Center, Yonsei University, Seoul, 120-749, S. Korea
SOURCE: International Journal of Systematic and Evolutionary Microbiology (2001), 51(4), 1539-1548
CODEN: ISEMF5; ISSN: 1466-5026
PUBLISHER: Society for General Microbiology
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A novel strictly anaerobic, extremely thermophilic, spore-forming and xylose-utilizing bacterium, designated strain KB-1TP (type and patent strain), was isolated from a geothermal hot stream at Sileri on Java island, Indonesia. The cells were rod-shaped, motile and had terminal spores. The newly isolated strain stained Gram-pos. and the cells occurred singly or in pairs during the exponential growth phase. The temperature optimum for growth was 75 °C and growth occurred in the range 50-85 °C. The pH range for growth was 4·5-9·0, with an optimum at pH 6·5. Strain KB-1TP grew chemo-organotrophically by fermenting a wide range of substrates such as glucose, fructose, D-xylose, lactose, maltose, sucrose, mannose, galactose, cellobiose, pullulan and soluble starch. Arabinose, xylan, cellulose, olive oil and Tween 80 were not fermented. The predominant fermentation end products after growth on glucose were lactate, acetate, ethanol, CO2 and small amts. of isovaleric acid, butyric acid, propionic acid, 1-pentanol and 2-propanol. Thiosulfate was reduced to H2S. Strain KB-1TP was sensitive to tetracycline, chloramphenicol, penicillin G, neomycin, kanamycin, vancomycin and rifampicin at concns. of 100 μg ml-1. No effect was observed with chloramphenicol and neomycin at concns. of 10 μg ml-1. This indicates that strain KB-1TP belongs to the bacterial domain. The G+C content of the DNA was 37 mol%. The comparison of the 16S rDNA sequence to that of closely related strains revealed that strain KB-1TP belonged to clostridial cluster V, showing highest sequence identities (92·7%) to members of the genus Thermoanaerobacter. Taking into account the physiol. and mol. properties of the new isolate, it is proposed that strain KB-1TP should be classified as a new species of the genus Thermoanaerobacter, designated Thermoanaerobacter yonseiensis. The type strain, KB-1TP, has been deposited in the Korean Federation of Culture Collections (KFCC 11116P) as a patent strain and in the Deutsche Sammlung von Mikroorganismen und Zellkulturen as a type strain (= DSM 13777T).
REFERENCE COUNT: 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 7 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:287877 CAPLUS
DOCUMENT NUMBER: 135:16505
TITLE: Anaerobranca gottschalkii sp. nov., a novel thermoalkaliphilic bacterium that grows anaerobically at high pH and temperature
AUTHOR(S): Prowe, Steffen G.; Antranikian, G.
CORPORATE SOURCE: Institute of Technical Microbiology, Technical

University Hamburg-Harburg, Hamburg, D-21071, Germany
SOURCE: International Journal of Systematic and Evolutionary Microbiology (2001), 51(2), 457-465
CODEN: ISEMF5; ISSN: 1466-5026
PUBLISHER: Society for General Microbiology
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A novel thermoalkaliphilic, obligately anaerobic bacterium was isolated from a humid soil sample of a hot inlet of Lake Bogoria, Kenya. The newly isolated strain grows optimally at pH 9.5 and 50-55°C and its growth range is pH 6.0-10.5 and 30-65°C. Unlike the already known thermoalkaliphiles, the strain grows heterotrophically on a variety of mono- and polysaccharides (glucose, ribose, mannose, fructose, sucrose, maltose, starch, pullulan, xylan and cellulose) and on proteinaceous substrates such as yeast extract, peptone and tryptone. No dissimilatory sulfate reduction was observed, whereas thiosulfate was found to enhance growth when glucose or starch were used as substrates. Under optimal conditions, the doubling time is 48 min. Sodium ions are necessary for growth, with an optimal concentration of 230 mM (1% NaCl, w/v) at pH 9.5. The rod-shaped cells are motile in the exponential growth phase under optimal growth conditions. Despite the Gram-neg. staining and neg. KOH assay, the strain is a Gram-pos. organism, having an atypically thin cell wall. A sheath-like structure occurs at the cell separation area and parts of a surface layer-like structure were also observed Based on physiol. properties and mol. biol. anal., the strain falls within the radiation of the clostridia and represents a new species of Anaerobranca within the Clostridium/Bacillus subphylum of the Gram-pos. bacteria. Strain LBS3T (= DSM 13577T) is named Anaerobranca gottschalkii sp. nov. and is designated as the type strain.

REFERENCE COUNT: 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 8 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:60734 CAPLUS
DOCUMENT NUMBER: 132:247805
TITLE: Gene cloning, nucleotide sequence and biochemical properties of a cytoplasmic cyclomaltodextrinase (neopullulanase) from Alicyclobacillus acidocaldarius, reclassification of a group of enzymes
AUTHOR(S): Matzke, J.; Herrmann, A.; Schneider, E.; Bakker, E. P.
CORPORATE SOURCE: Abteilung Mikrobiologie, Universitat Osnabruck, Osnabruck, D-49069, Germany
SOURCE: FEMS Microbiology Letters (2000), 183(1), 55-61
CODEN: FMLED7; ISSN: 0378-1097
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A gene encoding a cyclomaltodextrinase (neopullulanase) was cloned from the thermoacidophilic bacterium Alicyclobacillus acidocaldarius ATCC27009 and its nucleotide sequence was determined The encoded CdaA protein lacked an N-terminal signal sequence and aligned well with a family of bacterial proteins described as maltogenic α-amylases, neopullulanases or cyclomaltodextrinases. Escherichia coli cells harboring the cloned cdaA gene produced a 66-kDa protein that degraded pullulan in a SDS-polyacrylamide gel. A. acidocaldarius cells grown on maltose, soluble starch or pullulan synthesized the same protein. Neopullulanase activity of the protein was cytoplasmic and its pH optimum of 5.5 was close to the pH value of the cytoplasm. CdaA degraded cyclomaltodextrins rapidly and pullulan (to panose) more slowly. It is proposed that CdaA functions as a cytoplasmic cyclomaltodextrinase (E.C. 3.2.1.54).

REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 9 OF 22 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1999:692458 CAPLUS

DOCUMENT NUMBER: 132:75931

TITLE: Co-expression of saccharifying alkaline amylase and pullulanase in Micrococcus halobius OR-1 isolated from tapioca cultivar soil

AUTHOR(S): Devi, Kamakshi P. Raj; Yogeeswaran, Ganesa

CORPORATE SOURCE: Division of Medical Biotechnology - Research and Development, Affiliated to University of Madras, Tamilnad Hospital Academic Trust - Research Council, Chennai, 601 302, India

SOURCE: World Journal of Microbiology & Biotechnology (1999), 15(2), 199-204
CODEN: WJMBEY; ISSN: 0959-3993

PUBLISHER: Kluwer Academic Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Bacterial isolates from Tapioca cultivar soil were systematically identified. The effect of culture conditions and medium components on the production of extracellular amylase and pullulanase by Micrococcus halobius OR-1 were investigated. Amylase and pullulanase activity in the cell-free supernatant reached a maximum of 8.6 U/mL and 4.8 U/mL after 48 h, resp. The enzyme converted the complex polysaccharides starch, dextrin, pullulan, amylose and amylopectin predominantly into maltotriose. Saccharification of 15% cereal, tuber starches and root starches with the whole cultured cells (WCC) or cell-free supernatant (CFS) showed comparable and complete saccharification within 90 min. These saccharifying enzymes had a pH optimum of 8.0 and were stable over a broad pH range of 6-12. Thus the coexpressed physicochem. compatible extracellular amylase and pullulanase produced by the Micrococcus halobius OR-1 strain might have important value in the enzyme-based starch saccharification industry.

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:788093 CAPLUS
DOCUMENT NUMBER: 140:275831
TITLE: Recent trends in the use of polysaccharides for improved delivery of therapeutic agents: Pharmacokinetic and pharmacodynamic perspectives
AUTHOR(S): Mehvar, Reza
CORPORATE SOURCE: School of Pharmacy, Texas Tech University Health Sciences Center, Amarillo, TX, 79106, USA
SOURCE: Current Pharmaceutical Biotechnology (2003), 4(5), 283-302
CODEN: CPBUBP; ISSN: 1389-2010
PUBLISHER: Bentham Science Publishers Ltd.
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English
AB A review. New and innovative methods of delivery of therapeutic agents using polysaccharides were recently developed, which target site of action, increase the intensity and/or prolong pharmacol. action, and/or reduce toxicity of small mol. drugs, proteins, or enzymes. This review is focused on the role of dextran, pullulan, and mannan polysaccharides in such applications. While dextran and pullulan are glucose polymers with different glucosidic linkages, mannan is composed of mannose units. In terms of pharmacokinetics of the carriers themselves, mol. weight (MW), elec. charge, various chemical modifications, and degree of polydispersity and/or branching would mostly determine their fate in vivo. Generally, large MW polysaccharides (MWs ≥ 40 kD) have low clearance and relatively long plasma half life, resulting in accumulation in reticuloendothelial or tumor tissues. The tumor accumulation in most cases is a passive targeting due to "enhanced permeation and retention" of macromols. by tumors. Addnl., drugs such as anticancer agents may be actively targeted to specific cells by polysaccharides to which appropriate ligands are attached. In terms of mode of use, polysaccharides were utilized in a variety of innovative ways for improvement of drug delivery. Their most important application was as carriers for preparation of macromol. prodrugs that are normally inactive and need to release the active drug at the site(s) of interest. Also, they were used for preparation of macromol.-protein conjugates, which may retain the activity of the proteins, to increase the duration of effect and decrease the immunogenicity of proteins. Several other new applications, such as polysaccharide-anchored liposomal formulations, were also gained attention recently and are briefly reviewed here. Finally, 4 recent examples of polysaccharide-based delivery systems involving specific drugs/imaging agents are reviewed in detail in terms of their development, pharmacokinetics, and pharmacodynamics. Collectively, these data suggest that macromol. polysaccharides are promising agents for improving drug delivery.
REFERENCE COUNT: 101 THERE ARE 101 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 2 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:505875 CAPLUS
DOCUMENT NUMBER: 135:225912
TITLE: Optimization of conditions for the production of pullulan and high molecular weight pullulan by Aureobasidium pullulans
AUTHOR(S): Lee, Ji-Hyun; Kim, Jeong-Hwa; Zhu, Il-Hui; Zhan, Xiao-Bei; Lee, Jin-Woo; Shin, Dong-Hoon; Kim, Sung-Koo
CORPORATE SOURCE: Division of Food and Biotechnology, Pukyung National University, Pusan, 608-737, S. Korea
SOURCE: Biotechnology Letters (2001), 23(10), 817-820
CODEN: BILED3; ISSN: 0141-5492
PUBLISHER: Kluwer Academic Publishers

DOCUMENT TYPE: Journal
LANGUAGE: English
AB Aureobasidium pullulans had a maximum yield coefficient of pullulan (Yp/s = 0.24) with an initial pH of the culture broth of 6.5 in a shake-flask culture. In a batch culture, the maximum pullulan yield coefficient of 0.30 was obtained at the aeration rate of 0.5 vvm. A yeast-like form and mycelial form of cells were found at the culture broth with pH controlled at 4.5 with a maximum yield coefficient of pullulan of 0.27. However, a high portion (35%) of high mol. weight pullulan (Mw > 2 000 000) was produced at pH 6.5 with a yeast-like morphol. of the cells.
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:109581 CAPLUS
DOCUMENT NUMBER: 135:13818
TITLE: Evidence for receptor-mediated hepatic uptake of pullulan in rats
AUTHOR(S): Kaneo, Y.; Tanaka, T.; Nakano, T.; Yamaguchi, Y.
CORPORATE SOURCE: Laboratory of Biopharmaceutics, Faculty of Pharmacy and Pharmaceutical Sciences, Fukuyama University, Hiroshima, Fukuyama, 729-0292, Japan
SOURCE: Journal of Controlled Release (2001), 70(3), 365-373
CODEN: JCREEC; ISSN: 0168-3659
PUBLISHER: Elsevier Science Ireland Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Fluorescein-labeled pullulan (FP-60; MW 58,200) was prepared by reaction with FITC according to the method of de Belder and Granath. The hepatic distribution of FP-60 was examined using a specific high-performance size-exclusion chromatog. I.v. administered FP-60 was rapidly eliminated from the blood circulation followed by an appreciable distribution to the liver. A marked dose-dependency was seen in the hepatic uptake of FP-60 which was markedly reduced by the coadministration of both asialofetuin and arabinogalactan. Measurement of the hepatocellular localization demonstrated the overwhelming distribution of FP-60 in the parenchymal liver cell fraction. Furthermore, microscopic examination revealed that FP-60 was effectively endocytosed by the parenchymal liver cells. Radiolabeled pullulan ([125I]P-60) was prepared by 125I-labeling the tyramine derivative of pullulan which was synthesized by the cyano-transfer method. [125I]P-60 was predominantly accumulated in sliced rat liver tissue at 37°C, which was drastically inhibited by the addition of both asialofetuin and arabinogalactan. The kinetic parameters of the specific binding of [125I]P-60 to monolayered hepatocytes at 0°C were almost identical to those for asialofetuin. The binding of [125I]P-60 to isolated parenchymal cells was significantly inhibited by arabinogalactan and asialofetuin, however dextran, the same glucan as pullulan, did not affect the binding of [125I]P-60. It was found that pullulan, which is bound to the asialoglycoprotein receptor with high affinity, is subsequently internalized to the hepatocyte via receptor-mediated endocytosis.
REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1995:676431 CAPLUS
DOCUMENT NUMBER: 123:93069
TITLE: Comparison of body distribution of poly(vinyl alcohol) with other water-soluble polymers after intravenous administration
AUTHOR(S): Yamaoka, Tetsuji; Tabata, Yasuhiko; Ikada, Yoshito
CORPORATE SOURCE: Research Center for Biomedical Engineering, Kyoto

University, Kyoto, 606, Japan
SOURCE: Journal of Pharmacy and Pharmacology (1995), 47(6), 479-86
CODEN: JPPMAB; ISSN: 0022-3573
PUBLISHER: Royal Pharmaceutical Society of Great Britain
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The body distribution of poly(vinyl alc.) (PVA) with mol. wts. (MW) from 14,800 to 434,000 Da was investigated after i.v. administration and compared with that of other water-soluble polymers such as poly(ethylene glycol) (PEG), gelatin, dextran, and pullulan. The half-life of PVA in the circulation was prolonged from 90 min (MW 14,800 Da) to 23 h (MW 434,000 Da), similar to that of PEG which had a half-life of 30 min (MW 6000) and 20 h (MW 170,000). However, the half-life of PVA was much longer than that of other polymers when compared at a similar mol. weight PVA was located in most organs but with very small accumulation. An insignificant interaction of PVA with cell components, such as macrophages and blood cells, was observed Similar to PEG, the excretion rate of PVA at the glomeruli was rapidly reduced around 30,000 Da, as the mol. weight increased. These results indicate that the half-life of i.v. injected PVA in the blood was mainly determined by the permeation characteristics of the kidney.

L10 ANSWER 5 OF 7 MEDLINE on STN
ACCESSION NUMBER: 2003467925 MEDLINE
DOCUMENT NUMBER: PubMed ID: 14529419
TITLE: Recent trends in the use of polysaccharides for improved delivery of therapeutic agents: pharmacokinetic and pharmacodynamic perspectives.
AUTHOR: Mehvar Reza
CORPORATE SOURCE: School of Pharmacy, Texas Tech University Health Sciences Center, Amarillo, TX 79106, USA.. reza.mehvar@ttuhsc.edu
CONTRACT NUMBER: GM49385 (NIGMS)
GM57611 (NIGMS)
SOURCE: Current pharmaceutical biotechnology, (2003 Oct) Vol. 4, No. 5, pp. 283-302. Ref: 101
Journal code: 100960530. ISSN: 1389-2010.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200311
ENTRY DATE: Entered STN: 8 Oct 2003
Last Updated on STN: 18 Dec 2003
Entered Medline: 21 Nov 2003

AB New and innovative methods of delivery of therapeutic agents using polysaccharides have been recently developed, which target site of action, increase the intensity and/or prolong pharmacologic action, and/or reduce toxicity of small molecule drugs, proteins, or enzymes. This review is focused on the role of dextran, pullulan, and mannan polysaccharides in such applications. While dextran and pullulan are glucose polymers with different glucosidic linkages, mannan is composed of mannose units. In terms of pharmacokinetics of the carriers themselves, molecular weight (MW), electric charge, various chemical modifications, and degree of polydispersity and/or branching would mostly determine their fate in vivo. Generally, large MW polysaccharides (MWs > or = 40 kD) have low clearance and relatively long plasma half life, resulting in accumulation in reticuloendothelial or tumor tissues. The tumor accumulation in most cases is a passive targeting due to "enhanced permeation and retention" of macromolecules by tumors. Additionally, drugs such as anticancer agents may be actively targeted to specific cells by polysaccharides to which appropriate ligands are attached. In terms of mode of use,

polysaccharides have been utilized in a variety of innovative ways for improvement of drug delivery. Their most important application has been as carriers for preparation of macromolecular prodrugs that are normally inactive and need to release the active drug at the site(s) of interest. Also, they have been used for preparation of macromolecule-protein conjugates, which may retain the activity of the proteins, in order to increase the duration of effect and decrease the immunogenicity of proteins. Several other new applications, such as polysaccharide-anchored liposomal formulations, have also been gained attention recently and are briefly reviewed here. Finally, four recent examples of polysaccharide-based delivery systems involving specific drugs/imaging agents are reviewed in detail in terms of their development, pharmacokinetics, and pharmacodynamics. Collectively, these data suggest that macromolecular polysaccharides are promising agents for improving drug delivery.

L10 ANSWER 6 OF 7 MEDLINE on STN
ACCESSION NUMBER: 2001285505 MEDLINE
DOCUMENT NUMBER: PubMed ID: 11182206
TITLE: Evidence for receptor-mediated hepatic uptake of pullulan in rats.
AUTHOR: Kaneo Y; Tanaka T; Nakano T; Yamaguchi Y
CORPORATE SOURCE: Laboratory of Biopharmaceutics, Faculty of Pharmacy and Pharmaceutical Sciences, Fukuyama University, Fukuyama, Hiroshima 729-0292, Japan.. kaneo@fupharm.fukuyama-u.ac.jp
SOURCE: Journal of controlled release : official journal of the Controlled Release Society, (2001 Feb 23) Vol. 70, No. 3, pp. 365-73.
Journal code: 8607908. ISSN: 0168-3659.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200105
ENTRY DATE: Entered STN: 29 May 2001
Last Updated on STN: 29 May 2001
Entered Medline: 24 May 2001

AB Fluorescein-labeled pullulan (FP-60; MW 58,200) was prepared by reaction with FITC according to the method of de Belder and Granath. The hepatic distribution of FP-60 was examined using a specific high-performance size-exclusion chromatography. Intravenously administered FP-60 was rapidly eliminated from the blood circulation followed by an appreciable distribution to the liver. A marked dose-dependency was seen in the hepatic uptake of FP-60 which was markedly reduced by the coadministration of both asialofetuin and arabinogalactan. Measurement of the hepatocellular localization demonstrated the overwhelming distribution of FP-60 in the parenchymal liver cell fraction. Furthermore, microscopic examination revealed that FP-60 was effectively endocytosed by the parenchymal liver cells. Radiolabeled pullulan ([(125)I]P-60) was prepared by (125)I-labeling the tyramine derivative of pullulan which was synthesized by the cyano-transfer method. [(125)I]P-60 was predominantly accumulated in sliced rat liver tissue at 37 degrees C, which was drastically inhibited by the addition of both asialofetuin and arabinogalactan. The kinetic parameters of the specific binding of [(125)I]P-60 to monolayered hepatocytes at 0 degrees C were almost identical to those for asialofetuin. The binding of [(125)I]P-60 to isolated parenchymal cells was significantly inhibited by arabinogalactan and asialofetuin, however dextran, the same glucan as pullulan, did not affect the binding of [(125)I]P-60. It was found that pullulan, which is bound to the asialoglycoprotein receptor with high affinity, is subsequently internalized to the hepatocyte via receptor-mediated endocytosis.

L10 ANSWER 7 OF 7 MEDLINE on STN
ACCESSION NUMBER: 95404436 MEDLINE
DOCUMENT NUMBER: PubMed ID: 7674130
TITLE: Comparison of body distribution of poly(vinyl alcohol) with other water-soluble polymers after intravenous administration.
AUTHOR: Yamaoka T; Tabata Y; Ikada Y
CORPORATE SOURCE: Research Center for Biomedical Engineering, Kyoto University, Japan.
SOURCE: The Journal of pharmacy and pharmacology, (1995 Jun) Vol. 47, No. 6, pp. 479-86.
Journal code: 0376363. ISSN: 0022-3573.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199510
ENTRY DATE: Entered STN: 26 Oct 1995
Last Updated on STN: 26 Oct 1995
Entered Medline: 18 Oct 1995

AB The body distribution of poly(vinyl alcohol) (PVA) with molecular weights (MW) from 14,800 to 434,000 Da was investigated after intravenous administration and compared with that of other water-soluble polymers such as poly(ethylene glycol) (PEG), gelatin, dextran, and pullulan. The half-life of PVA in the circulation was prolonged from 90 min (MW 14,800 Da) to 23 h (MW 434,000 Da), similar to that of PEG which had a half-life of 30 min (MW 6000) and 20 h (MW 170,000). However, the half-life of PVA was much longer than that of other polymers when compared at a similar molecular weight. PVA was located in most organs but with very small accumulation. An insignificant interaction of PVA with cell components, such as macrophages and blood cells, was observed. Similar to PEG, the excretion rate of PVA at the glomeruli was rapidly reduced around 30,000 Da, as the molecular weight increased. These results indicate that the half-life of intravenously injected PVA in the blood was mainly determined by the permeation characteristics of the kidney.

L13 ANSWER 15 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:218404 CAPLUS
DOCUMENT NUMBER: 136:368506
TITLE: Production and characterization of pullulan from beet molasses using a nonpigmented strain of Aureobasidium pullulans in batch culture
AUTHOR(S): Lazaridou, Athina; Biliaderis, Costas G.; Roukas, Triantafyllos; Izydorczyk, Marta
CORPORATE SOURCE: Department of Food Science and Technology, Aristotle University of Thessaloniki, Thessaloniki, 540 06, Greece
SOURCE: Applied Biochemistry and Biotechnology (2002), 97(1), 1-22
CODEN: ABIBDL; ISSN: 0273-2289
PUBLISHER: Humana Press Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The production of pullulan from beet molasses by a pigment-free strain of Aureobasidium pullulans on shake-flask culture was investigated. Combined pretreatment of molasses with sulfuric acid and activated carbon to remove potential fermentation inhibitors present in molasses resulted in a maximum pullulan concentration of 24 g/L, a biomass dry wt of 14 g/L, a pullulan yield of 52.5%, and a sugar utilization of 92% with optimum fermentation conditions (initial sugar concentration of 50 g/L and initial pH of 7.0). The addition of other nutrients as carbon and nitrogen supplements (olive oil, ammonium sulfate, yeast extract) did not further improve the production of the exopolysaccharides. Structural characterization of the isolated polysaccharides from the fermentation broths by 13C-NMR spectroscopy and pullulanase digestion combined with size-exclusion chromatog. confirmed the identity of pullulan and the homogeneity (>93% dry basis) of the elaborated polysaccharides by the microorganism. Using multi-angle laser light scattering and refractive index detectors in conjunction with high-performance size-exclusion chromatog. mol. size distributions and ests. of the mol. wt. (Mw = 2.1-4.1 + 105), root mean square of the radius of gyration (Rg = 30-38 nm), and polydispersity index (Mw/Mn = 1.4-2.4) were obtained. The fermentation products of molasses pretreated with sulfuric acid and/or activated carbon were more homogeneous and free of contaminating proteins. In the concentration range of 2.8-10.0 (w/v), the solution's rheol. behavior of the isolated pullulans was almost Newtonian (within 1 and 1200 s-1 at 20°C); a slight shear thinning was observed at 10.0 (w/v) for the high mol. wt. samples. Overall, beet molasses pretreated with sulfuric acid and activated carbon appears as an attractive fermentation medium for the production of pullulan by A. pullulans.
REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 16 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:791386 CAPLUS
DOCUMENT NUMBER: 137:87818
TITLE: Anticoagulant sulfated polysaccharides: Part I. Synthesis and structure-activity relationships of new pullulan sulfates
AUTHOR(S): Alban, S.; Schauerte, A.; Franz, G.
CORPORATE SOURCE: Institute of Pharmacy, University of Regensburg, Regensburg, 93040, Germany
SOURCE: Carbohydrate Polymers (2001), Volume Date 2002, 47(3), 267-276
CODEN: CAPOD8; ISSN: 0144-8617
PUBLISHER: Elsevier Science Ireland Ltd.
DOCUMENT TYPE: Journal

LANGUAGE: English

AB In order to develop new anticoagulants as potential heparin alternatives, two pullulans with different mol. wt. (MW) were used as starting polymers for the partial synthesis of a structurally new class of sulfated polysaccharides. Sulfation of these linear α-1,4-/1,6-glucans was carried out by a method with a SO3-pyridine complex in DMF, which had been optimized for the modification of β-1,3-glucans. Modifications of this methods resulted in pullulan sulfates with degrees of sulfation (DS) ranging from 0.17 to 1.99 and MW between 15 and 250 kDa. More than 50% of the sulfate groups were bound to the secondary C atoms in positions 2, 3 and 4 of the glucose monomers. The anticoagulant activity of the obtained pullulan sulfates was determined in the coagulation assays prothrombin time (PT), activated partial thromboplastin time (APTT), Heptest and thrombin time (TT). They represent potent anticoagulants reaching the efficacy of heparin. Their activity not only improves with increasing DS and MW, but also with increasing part of sulfate groups in positions 2, 3 and 4. In addition, their action profile changes in dependence on their individual structure as reflected by the ratio of the TT- to the APTT-activity. The pullulan sulfates specifically interfere with different stages of the coagulation cascade, and these interactions have different requirements on the chemical structure.

REFERENCE COUNT: 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 17 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:505875 CAPLUS

DOCUMENT NUMBER: 135:225912

TITLE: Optimization of conditions for the production of pullulan and high molecular weight pullulan by Aureobasidium pullulans

AUTHOR(S): Lee, Ji-Hyun; Kim, Jeong-Hwa; Zhu, Il-Hui; Zhan, Xiao-Bei; Lee, Jin-Woo; Shin, Dong-Hoon; Kim, Sung-Koo

CORPORATE SOURCE: Division of Food and Biotechnology, Pukyung National University, Pusan, 608-737, S. Korea

SOURCE: Biotechnology Letters (2001), 23(10), 817-820
CODEN: BILED3; ISSN: 0141-5492

PUBLISHER: Kluwer Academic Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Aureobasidium pullulans had a maximum yield coefficient of pullulan (Yp/s = 0.24) with an initial pH of the culture broth of 6.5 in a shake-flask culture. In a batch culture, the maximum pullulan yield coefficient of 0.30 was obtained at the aeration rate of 0.5 vvm. A yeast-like form and mycelial form of cells were found at the culture broth with pH controlled at 4.5 with a maximum yield coefficient of pullulan of 0.27. However, a high portion (35%) of high mol. wt. pullulan (Mw > 2 000 000) was produced at pH 6.5 with a yeast-like morphol. of the cells.

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 18 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:65706 CAPLUS

DOCUMENT NUMBER: 133:22294

TITLE: Evaluation of molecular weight of hyaluronate preparations by size-exclusion chromatography

AUTHOR(S): Yomota, Chikako; Miyazaki, Tamaki; Okada, Satoshi

CORPORATE SOURCE: Hoenzaka 1-1-43, Chuo-ku, Osaka, 540-0006, Japan

SOURCE: Kokuritsu Iyakuhin Shokuhin Eisei Kenkyusho Hokoku (1999), 117, 135-139
CODEN: KISHFC; ISSN: 1343-4292

PUBLISHER: Kokuritsu Iyakuhin Shokuhin Eisei Kenkyusho Kagaku Busshitsu Johobu

DOCUMENT TYPE: Journal
LANGUAGE: Japanese
AB Hyaluronate (HA), a glycosaminoglycan polysaccharide, has been used as a biomedical polymer to treat osteoarthritis by infra-articular injections and in ophthalmic surgery, such as anterior segment surgery. In this study, the mol. wt. (Mw) of HA prepns. was estimated by size-exclusion chromatog. (SEC), using HA and pullulan fractions as mol. wt. stds., and the Mw values obtained were compared to those obtained with a low angle laser light scattering detector (LALLS). The results showed that the universal calibration with pullulan as the standard is useful for HA prepns. The conditions of SEC for HA were also investigated, and the results suggested that a high tonic strength and low flow rate of the eluent were preferable for high mol. wt. HA prepns.

L13 ANSWER 19 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1999:769316 CAPLUS
DOCUMENT NUMBER: 131:352708
TITLE: Aggregation of cellulose in lithium chloride/N,N-dimethylacetamide
AUTHOR(S): Sjoholm, E.; Gustafsson, K.; Eriksson, B.; Brown, W.; Colmsjo, A.
CORPORATE SOURCE: Swedish Pulp and Paper Research Institute, Stockholm, SE-114 86, Swed.
SOURCE: Carbohydrate Polymers (1999), Volume Date 2000, 41(2), 153-161
CODEN: CAPOD8; ISSN: 0144-8617
PUBLISHER: Elsevier Science Ireland Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Hardwood kraft pulps can be completely dissolved in LiCl/N,N-dimethylacetamide (LiCl/DMAc). The cellulose (I) and hemicellulose components can be separated by SEC. The mol. wt. distribution that corresponds to I is extended up to the high-mol.-wt. region, and the wt.-average-mol.-wt. (MW) relative to pullulan (II) of this distribution is high. Light scattering (LS) measurements were conducted on a cotton linters sample of a similar elution volume as the I portion of the pulp. The true MW of the cotton linters sample measured by LS was in close agreement with the MW determined relative to II using SEC. Gaussian curve fitting revealed an addnl. high-mol.-wt. component, not apparent in the chromatogram of hardwood pulp. Based on this finding the high MW is suggested to be caused by aggregation of cellulose in LiCl/DMAc. The influence of dissoln. conditions is discussed and a method for de-aggregating the I portion of dissolved hardwood pulps is proposed.
REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 20 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1999:597593 CAPLUS
DOCUMENT NUMBER: 132:165180
TITLE: α-1,4-Branched pullulan produced by the action of cyclodextrin glucanotransferase
AUTHOR(S): Kobayashi, Mikihiko; Tsuzuki, Wakako; Funane, Kazumi; Kato, Yoji
CORPORATE SOURCE: Natl. Food Res. Inst., Tsukuba, 305-8642, Japan
SOURCE: Journal of Applied Glycoscience (1999), 46(3), 273-280
CODEN: JAGLFX; ISSN: 1344-7882
PUBLISHER: Japanese Society of Applied Glycoscience
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The action of cyclodextrin glucanotransferase (CGTase: EC 2.4.1.19) on pullulan was examined A poor susceptibility of CGTase to pullulan was enhanced by increasing the substrate and enzyme

concns. In spite of a small increase in reducing sugar, large changes in the mol. size of pullulan were observed especially in high-mol. wt. pullulan PF30 (Mw 283,000). These results indicated that a disproportionation activity of CGTase worked predominantly for the reconstruction of pullulan. The product pullulan showed different responses from pullulan when the interaction with the fluorescent reagent and hydrolysis with isoamylase and glucoamylase were compared. Structural analyses of product pullulans by two-dimensional NMR, HMQC, and methylation indicated that CGTase introduced α-1,4-branch points at the nonreducing side of maltotriosyl units in pullulan mol. yielding, just like α-1,6-branch points on the linear back bones of α-1,4-linkages.

L13 ANSWER 21 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1997:787986 CAPLUS
DOCUMENT NUMBER: 128:53332
TITLE: Determination of molecular-weight distribution of dextran for injection by size-exclusion chromatography and study for molecular-weight standards
AUTHOR(S): Yomota, Chikako; Okada, Satoshi
CORPORATE SOURCE: Osaka Branch, Natl. Inst. Health Sci., Osaka, 540, Japan
SOURCE: Bunseki Kagaku (1997), 46(12), 979-985
CODEN: BNSKAK; ISSN: 0525-1931
PUBLISHER: Nippon Bunseki Kagakkai
DOCUMENT TYPE: Journal
LANGUAGE: Japanese
AB It is well known that dextran for clin. use should have narrow mol.-wt. (Mw) distributions, because any material with a Mw that is too small is rapidly lost from circulation, and is therefore therapeutically ineffective; also, any material with a Mw that is too high can interfere with the normal coagulation process of the blood. Therefore, accurate and rapid methods are necessary for measuring the Mw distribution of dextran. In this study, the mol. wt. of dextran for injection and dextran prepns. were estimated by a method adopted in the European Pharmacopoeia (EP) using the polydisperse standard of dextran and also by the usual method using the pullulan stds. From the results, it has been clarified that pullulan is a useful standard for the injection of dextran, such as dextran 70 and dextran 40. It was also found that the mol. wts. of almost all clin. dextran in Japan seem to be smaller than the specifications described in EP, whereas their limiting viscosities are in the range of the specifications in the Japanese Pharmacopoeia.

L13 ANSWER 22 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1996:154801 CAPLUS
DOCUMENT NUMBER: 124:235355
TITLE: Chemically modified exopolysaccharide pullulans: physico-chemical characteristics of ionic derivatives
AUTHOR(S): Picton, L.; Mocanu, G.; Mihai, D.; Carpov, A.; Muller, G.
CORPORATE SOURCE: Univ. Rouen, Mont Saint Aignan, 76 821, Fr.
SOURCE: Carbohydrate Polymers (1996), Volume Date 1995, 28(2), 131-6
CODEN: CAPOD8; ISSN: 0144-8617
PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Some physicochem. characteristics of dilute solns. of the exopolysaccharide pullulan and its carboxymethyl, sulfoethyl, and sulfopropyl ionic derivs. are presented. Online size-exclusion chromatog./multi-angle laser light scattering (SEC/MALLS) was used for establishing their wt. average mol. wt. (Mw), number average mol. wt. (Mn),

polydispersity index (Ip = Mw/Mn), and radius of gyration (Rg).

L13 ANSWER 23 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1995:676431 CAPLUS
DOCUMENT NUMBER: 123:93069
TITLE: Comparison of body distribution of poly(vinyl alcohol) with other water-soluble polymers after intravenous administration
AUTHOR(S): Yamaoka, Tetsuji; Tabata, Yasuhiko; Ikada, Yoshito
CORPORATE SOURCE: Research Center for Biomedical Engineering, Kyoto University, Kyoto, 606, Japan
SOURCE: Journal of Pharmacy and Pharmacology (1995), 47(6), 479-86
CODEN: JPPMAB; ISSN: 0022-3573
PUBLISHER: Royal Pharmaceutical Society of Great Britain
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The body distribution of poly(vinyl alc.) (PVA) with mol. wts. (MW) from 14,800 to 434,000 Da was investigated after i.v. administration and compared with that of other water-soluble polymers such as poly(ethylene glycol) (PEG), gelatin, dextran, and pullulan. The half-life of PVA in the circulation was prolonged from 90 min (MW 14,800 Da) to 23 h (MW 434,000 Da), similar to that of PEG which had a half-life of 30 min (MW 6000) and 20 h (MW 170,000). However, the half-life of PVA was much longer than that of other polymers when compared at a similar mol. wt. PVA was located in most organs but with very small accumulation. An insignificant interaction of PVA with cell components, such as macrophages and blood cells, was observed Similar to PEG, the excretion rate of PVA at the glomeruli was rapidly reduced around 30,000 Da, as the mol. wt. increased. These results indicate that the half-life of i.v. injected PVA in the blood was mainly determined by the permeation characteristics of the kidney.

L13 ANSWER 24 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:404240 CAPLUS
DOCUMENT NUMBER: 121:4240
TITLE: Studies by gel permeation chromatography of the molecular weights of Chinese lacquer polysaccharide
AUTHOR(S): Liu, Wei Li; Du, Yu Min; Zhang, Li Na
CORPORATE SOURCE: Inst. Resour. Dev. and Appl. Sci., Wuhan Univ., Wuhan, 430072, Peop. Rep. China
SOURCE: Shengwu Huaxue Yu Shengwu Wuli Xuebao (1993), 25(4), 409-15
CODEN: SHWPAU; ISSN: 0582-9879
DOCUMENT TYPE: Journal
LANGUAGE: Chinese
AB Chinese lacquer polysaccharide (LPS), consisting of a β-(1, 3)-linked galactose main chain and a number of randomly distributed side chains, is an ionic polysaccharide. The mol. wts. and mol. wt. distribution of three kinds (XM, DM and JS) of LPS obtained from tree sap in Hubei Province were measured by aqueous phase GPC made in China using two eluents:0.1M NaCl aqueous solution and 0.2M Na2SO4/0.01M phosphate buffer. The mol. wts. Mw, Mn and polydispersity index d of the polysaccharides were obtained by universal calibration with a pullulan standard The exptl. results from GPC are in good agreement with those by an absolute method with an error within 5%. The order of wt. average mol. wts. of three kinds of LPS is XM>DM>JS and value of 11.53+104, 10.90+104 and 9.82+104 resp.

L13 ANSWER 25 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1992:476314 CAPLUS
DOCUMENT NUMBER: 117:76314
TITLE: O/W-emulsion as formed by cholesterol-bearing pullulan
AUTHOR(S): Yamaguchi, Shigehiko; Fukui, Hiroki; Akiyoshi,

Kazunari; Sato, Toshinori; Sunamoto, Junzo
CORPORATE SOURCE: Dep. Polym. Chem., Kyoto Univ., Kyoto, 606, Japan
SOURCE: Nippon Kagaku Kaishi (1992), (2), 186-90
CODEN: NKAKB8; ISSN: 0369-4577
DOCUMENT TYPE: Journal
LANGUAGE: Japanese
AB Colloidal stability formed from trioctanoyl glyceride (TriC8) and cholesterol-bearing pullulans (CHP) was investigated. Pullulans (Mw.30,000, 50,000, and 137,000) were substituted in part by cholesteryl groups, and the substitution degree of the cholesterol moieties was 2-6 per hundred glucose units. When TriC8 was emulsified with a given amount of CHP under sonication, a very stable oil-in-water (O/W) emulsion was obtained. The hydrodynamic diameter determined by DLS was approx. 100-200 nm. The particle size of oil droplets was due to the temperature, the duration, and the power of sonication. The higher the substitution degree of cholesterol of CHP employed was, the more stable the emulsion obtained was, and the less the amount of CHP required was to obtain relatively stable emulsion. Similarly, the larger the mol. wt. of CHP was, the smaller the particle size was. The O/W-emulsion so obtained was stable enough even in the presence of the Ca2+ ion of physiol. concentration Using this technique, a lipophilic antitumor drug, α-linolenic acid (ALA), also could be well emulsified by mixing with a suitable amount of TriC8 in the presence of CHP. These newly developed O/W-emulsion stabilized by cholesterol-bearing pullulan derivative was promising as a potent carrier of lipophilic drugs.

L13 ANSWER 26 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1992:131515 CAPLUS
DOCUMENT NUMBER: 116:131515
TITLE: Molecular weight patterns of Naegeli amylodextrins
AUTHOR(S): Jackson, David S.; Waniska, Ralph D.; Rooney, Lloyd W.
CORPORATE SOURCE: Dep. Food Sci. Technol., Univ. Nebraska, Lincoln, NE, 68583-0919, USA
SOURCE: Starch/Staerke (1992), 44(2), 59-61
CODEN: STARDD; ISSN: 0038-9056
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The utility of a 4-column high-performance size-exclusion chromatog. (HPSEC) system to characterize starch-based carbohydrates of different sizes was examined Corn starches with varying amts. of amylose were treated with 16% H2SO4 to create Naegeli amylodextrins. During treatment, sub-samples were taken over 0-100 days. The washed, dried sub-samples were chromatog. analyzed using four Shodex Ionpak columns linked in series. Chromatograms showed the progressive depolymn. of starch. Pullulan mol. wt. stds. were used to estimate amylodextrin mol. wts. (MW). Number-average MW of amylodextrins decreased as the original starches' amylopectin content decreased. A single HPSEC system could be effectively used to characterize carbohydrates ranging in size from starch to amylodextrins; and to monitor the acid (or enzyme) depolymn. of starches.

L13 ANSWER 27 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1989:53449 CAPLUS
DOCUMENT NUMBER: 110:53449
TITLE: Purification and characterization of a thermostable pullulanase from Thermoactinomyces thalpophilus
AUTHOR(S): Odibo, F. J. C.; Obi, S. K. C.
CORPORATE SOURCE: Dep. Microbiol., Univ. Nigeria, Nsukka, Nigeria
SOURCE: Journal of Industrial Microbiology (1988), 3(6), 343-50
CODEN: JIMIE7; ISSN: 0169-4146
DOCUMENT TYPE: Journal
LANGUAGE: English

AB T. thalpophilus Number 15 produced an extracellular pullulanase in an aerobic fermentation with soluble starch, salts, and complex N sources. Acetone fractionation, ion-exchange chromatog., and gel filtration purified the enzyme from cell-free broth 16-fold to an electrophoretically homogeneous state (specific activity, 1352 U/mg protein; yield 4%). The purified enzyme (estimated MW 79,000) was optimally active at pH 7.0 and 70° and retained 90% relative activity at 80° (30 min) in the absence of substrate. The enzyme was activated by Co2+, inhibited by Hg2+, and exhibited enhanced stability in the presence of Ca2+. The enzyme hydrolyzed pullulan (Km 0.32%, wt./volume) forming maltotriose, and hydrolyzed amylopectin (Km 0.36%, wt./volume), amylopectin β-limit dextrin (Km 0.45%, wt./volume) and glycogen β-limit dextrin (Km 1.11%, wt./volume) forming maltotriose and maltose.

L13 ANSWER 28 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1988:142518 CAPLUS
DOCUMENT NUMBER: 108:142518
TITLE: Studies of hydrodynamic chromatography of polymers. IV. Capillary hydrodynamic chromatography of polysaccharides, schizophyllan, and xanthan
AUTHOR(S): Tazaki, Michiko; Maruyama, Iwao; Takase, Satoru; Homma, Terutaka
CORPORATE SOURCE: Dep. Chem. Process Eng., Ikutoku Tech. Univ., Atsugi, 243-02, Japan
SOURCE: Kobunshi Ronbunshu (1988), 45(1), 19-23
CODEN: KBRBA3; ISSN: 0386-2186
DOCUMENT TYPE: Journal
LANGUAGE: Japanese
AB Capillary hydrodynamic chromatog. (c-HDC) of schizophyllan (Sz, unfractionated, .hivin.Mw ≈ 250 + 104) and xanthan (xa, unfractionated, -Mw ≈ 220 + 104) is reported. Pullulan samples (84.6 + 104 and 43.5 + 104) were chromatographed as a reference material. No peak separation from low marker mols. was obtained for the samples. From chromatog. peaks, the effective diams. Rhe of Sz and Xa mols. in solution were obtained using polystyrene latex calibration. Intrinsic viscosity and mol. wt. data for these polysaccharides gave hydrodynamic vols. and resulting diams. of the mols. Rh in solution by the Flory-Fox equation. For Sz and Xa, Rhe values of 250-500 nm were obtained. Also the relation Rw .simeq. Rh was noted. For Xa, fractions having Rhe > 1000 nm were sometimes observed Chromatog. separation of such bigger fractions is one advantageous point in using c-HDC.

L13 ANSWER 29 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1987:423618 CAPLUS
DOCUMENT NUMBER: 107:23618
TITLE: Temperature and molecular weight dependence of the unperturbed dimensions of aqueous pullulan
AUTHOR(S): Buliga, Gregory S.; Brant, David A.
CORPORATE SOURCE: Dep. Chem., Univ. California, Irvine, CA, 92717, USA
SOURCE: International Journal of Biological Macromolecules (1987), 9(2), 71-6
CODEN: IJBMDR; ISSN: 0141-8130
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The intrinsic viscosities, [η], and light scattering mol. wts., Mw, second virial coeffs., A'2, and root-mean-square radii of gyration, (Sz2)1/2, were measured for a series of pullulan fractions in aqueous solution at 25°. These were used to establish the dependence on mol. wt. of [η], A'2, and (Sz2)1/2 and to deduce the limiting characteristic ratio of the unperturbed mean-square end-to-end distance C∞ (4.3) for aqueous pullulan at this

temperature The temperature dependence of C∞ was determined from measurements of the
same properties for selected fractions at a series of temps., and the temperature coefficient dln C∞/dT (-0.0043 deg-1) was established.

L13 ANSWER 30 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1987:138710 CAPLUS
DOCUMENT NUMBER: 106:138710
TITLE: Evaluation of root-mean-square radius of gyration as a parameter for universal calibration of polysaccharides
AUTHOR(S): Fishman, Marshall L.; Damert, William C.; Phillips, John G.; Barford, Robert A.
CORPORATE SOURCE: U. S. Dep. Agric., Philadelphia, PA, 19118, USA
SOURCE: Carbohydrate Research (1987), 160, 215-25
CODEN: CRBRAT; ISSN: 0008-6215
DOCUMENT TYPE: Journal
LANGUAGE: English
AB High-performance size-exclusion chromatog columns were calibrated in average root-mean-square radii of gyration (.hivin.Rgz) by a combination of com. narrow pullulan and broad dextran stds. The nonlinear calibration curves were fitted by a computer-aided, iterative, least-squares procedure. Values of .hivin.Rgz, obtained from a point-by-point transformation of the resp. pullulan and dextran chromatograms by utilizing universal calibration, were compared with input .hivin.Rgz calibration values. For stds. ranging in .hivin.Rgz value from 20.1 to 389 Å, the accuracy ranged 1-15.,3%. Furthermore, from relations in the literature, .hivin.Rgz values were transformed to .hivin. Mw. These values of .hivin.Mw were comparable to, but generally less accurate than, .hivin.Mw values from direct, mol.-wt. calibration.

L13 ANSWER 31 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1984:611602 CAPLUS
DOCUMENT NUMBER: 101:211602
TITLE: Preparation and solution properties of pullulan fractions as standard samples for water-soluble polymers
AUTHOR(S): Kawahara, K.; Ohta, K.; Miyamoto, H.; Nakamura, S.
CORPORATE SOURCE: Fac. Pharm. Sci., Nagasaki Univ., Nagasaki, 852, Japan
SOURCE: Carbohydrate Polymers (1984), 4(5), 335-56
CODEN: CAPOD8; ISSN: 0144-8617
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A series of pullulan fractions with mol. wts. in the range 5 + 103 to 8 + 105 were prepared The wt.-average mol. wt. (Mw) of all the samples was determined by sedimentation equilibrium The hydrodynamic properties of pullulan in aqueous solution were investigated by viscometry and ultracentrifugation. The exptl. results indicate that pullulan mols. in water are fairly stable and behave as expanded random coils when Mw is above 2 + 104. The mol. wt. distributions of the fractions were measured by gel filtration. The ratio Mw/Mn was close to 1.1, except for a sample with the highest Mw. The pullulan fractions prepared are well characterized and have a narrow mol. wt. distribution. They may be useful as standard samples for studies of water-soluble polymers.

L13 ANSWER 32 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1983:440125 CAPLUS
DOCUMENT NUMBER: 99:40125
TITLE: Pullulan preparation with limited molecular weight distribution for use as a plasma extender and an antihyperkinesis agent
INVENTOR(S): Yoshida, Mikihiko

PATENT ASSIGNEE(S): Hayashi Biochemical Laboratories, Inc., Japan
SOURCE: Ger. Offen., 16 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 3147193	A1	19830601	DE 1981-3147193	19811127
GB 2109391	A1	19830602	GB 1981-34001	19811111
GB 2109391	B2	19850206		
FR 2517326	A1	19830603	FR 1981-22479	19811201
FR 2517326	B1	19890901		
PRIORITY APPLN. INFO.:			DE 1981-3147193	19811127

AB Partial hydrolysis of pullulan (I) in the presence of inorg. acids, enzymes or ultrasound gave product for use as plasma extender or antihyperkinesis agent. Thus, 10% aqueous I [the ratio of wt.-average (Mw) to number-average (Mn) mol. wt. 2.3 (Mw = 300,000)] solution was acidified with HCl to pH .apprx.2, incubated for 2 h at 80°, neutralized with NaOH, purified with MeOH, decolorized with active C and deionized with ion exchanger to give .apprx.90 g hydrolyzed I with Mw/Mn 1.4 and Mw 50,000.

L13 ANSWER 33 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1983:90210 CAPLUS
DOCUMENT NUMBER: 98:90210
TITLE: Comparison of poly(ethylene oxide), pullulan and dextran as polymer standards in aqueous gel chromatography
AUTHOR(S): Kato, Tadaya; Tokuya, Tadashi; Takahashi, Akira
CORPORATE SOURCE: Fac. Eng., Mie Univ., Tsu, 514, Japan
SOURCE: Journal of Chromatography (1983), 256(1), 61-9
CODEN: JOCRAM; ISSN: 0021-9673
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Aqueous gel chromatog. for poly(ethylene oxide)(I) [25322-68-3], pullulan (II) [9057-02-7], and dextran [9004-54-0] were performed in 0.1 M aqueous NaCl at 25° using a crosslinked hydrophilic vinyl polymer gel. Calibration curves, log Mw vs. Vr,w, for I and II were linear over a wide mol wt. range, where Mw denotes the wt.-average mol. wt. and Vr,w the retention volume at the center of mass of the chromatogram peak. However, the corresponding calibration curve for dextran was nonlinear. Evidence in support of a universal calibration procedure was obtained for the three polymers since a single straight line could be drawn through the data points for all three polymers plotted on the same graphs for z-average square radius of gyration vs. Vr,w and for log [η] Mw vs. Vr,w, where [η] denotes intrinsic viscosity. The data indicated that either I or II was suitable as a polymer standard in aqueous gel chromatog., with I being the better.

L13 ANSWER 34 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1983:78177 CAPLUS
DOCUMENT NUMBER: 98:78177
TITLE: Pullulan with uniform molecular weights as a blood expander
PATENT ASSIGNEE(S): Hayashibara Biochemical Laboratories, Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 57141401	A2	19820901	JP 1981-156134	19811002
JP 02048561	B4	19901025		
PRIORITY APPLN. INFO.:			JP 1981-156134	19811002

AB Glucans, obtained from Aureobasidium pullulans, are partially degraded and fractionated, and pullulan [9057-02-7] with a wt. average mol. wt. (Mw)/number average mol. wt. (Mn) = <1.5 was isolated as a blood expander. Thus, 200 g pullulan (Mw/Mn = 2.3, Mw = 300,000) in water was partially degraded by HCl at pH 2, neutralized with NaOH, fractionated with MeOH, discolored with activated C, desalted with H-type and OH-type ion exchangers, filtered through a membrane, concentrated, dried, and pulverized to obtain 90 g white powder with Mw/Mn = 1.4 and Mw 50,000.

L13 ANSWER 35 OF 35 MEDLINE on STN
ACCESSION NUMBER: 2002168385 MEDLINE
DOCUMENT NUMBER: PubMed ID: 11900113
TITLE: Production and characterization of pullulan from beet molasses using a nonpigmented strain of Aureobasidium pullulans in batch culture.
AUTHOR: Lazaridou Athina; Biliaderis Costas G; Roukas Triantafyllos; Izydorczyk Marta
CORPORATE SOURCE: Department of Food Science and Technology, Aristotle University of Thessaloniki, Greece.
SOURCE: Applied biochemistry and biotechnology, (2002 Jan) Vol. 97, No. 1, pp. 1-22.
Journal code: 8208561. ISSN: 0273-2289.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200209
ENTRY DATE: Entered STN: 20 Mar 2002
Last Updated on STN: 12 Sep 2002
Entered Medline: 11 Sep 2002

AB The production of pullulan from beet molasses by a pigment-free strain of Aztreobasidium pullulans on shake-flask culture was investigated. Combined pretreatment of molasses with sulfuric acid and activated carbon to remove potential fermentation inhibitors present in molasses resulted in a maximum pullulan concentration of 24 g/L, a biomass dry wt of 14 g/L, a pullulan yield of 52.5%, and a sugar utilization of 92% with optimum fermentation conditions (initial sugar concentration of 50 g/L and initial pH of 7.0). The addition of other nutrients as carbon and nitrogen supplements (olive oil, ammonium sulfate, yeast extract) did not further improve the production of the exopolysaccharides. Structural characterization of the isolated polysaccharides from the fermentation broths by 13C-nuclear magnetic resonance spectroscopy and pullulanase digestion combined with size-exclusion chromatography confirmed the identity of pullulan and the homogeneity (>93% dry basis) of the elaborated polysaccharides by the microorganism. Using multiangle laser light scattering and refractive index detectors in conjunction with high-performance size-exclusion chromatography molecular size distributions and estimates of the molecular weight (Mw = 2.1-4.1 x 10(5)), root mean square of the radius of gyration (R = 30-38 nm), and polydispersity index (Mw/Mn = 1.4-2.4) were obtained. The fermentation products of molasses pretreated with sulfuric acid and/or activated carbon were more homogeneous and free of contaminating proteins. In the concentration range of 2.8-10.0 (w/v), the solution's rheologic behavior of the isolated pullulans was almost

Newtonian (within 1 and 1200 s(-1) at 20 degrees C); a slight shear thinning was observed at 10.0 (w/v) for the high molecular weight samples. Overall, beet molasses pretreated with sulfuric acid and activated carbon appears as an attractive fermentation medium for the production of pullulan by A. pullulans.

L13 ANSWER 1 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2006:448935 CAPLUS
DOCUMENT NUMBER: 145:103893
TITLE: Intrinsic viscosity-molecular weight relationship and hydrodynamic volume for pullulan
AUTHOR(S): Kasaai, Mohammad R.
CORPORATE SOURCE: Faculty of Agriculture, Mazandaran University, Sari, Iran
SOURCE: Journal of Applied Polymer Science (2006), 100(6), 4325-4332
CODEN: JAPNAB; ISSN: 0021-8995
PUBLISHER: John Wiley & Sons, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A numerical method for determination of Mark-Houwink-Sakurada (MHS) equation consts., a and K, was tested with success for two series of pullulan standard samples having narrow and broad mol. wt. distributions (MWD) and taken into account their poly-dispersity. Different solvents, which were used to determine the intrinsic viscosities and the viscometric consts., a and K (published in the literature for pullulan), were compared. The various parameters affecting the consts. are discussed. The procedure to determine the correct value of the hydrodynamic volume for pullulan was also described. This study resulted in the following MHS equations for narrow and broad MWD series of pullulan samples with Mw in the range of 5-1000 kDa: [η] = 1.990 + 10-4Mv0.667 = 1.990 + 10-4qMHSMw0.667 = 1.956 + 10-4Mw0.667 (Narrow MWD) [η] = 2.263 + 10-4Mv0.657 = 2.263 + 10-4qMHSMw0.657 = 2.056 + 10-4Mw0.657 (Broad MWD) where qMHS is the polydispersity correction factor and [η] is the intrinsic viscosity in dL g-1. The plot of log K vs. exponent a was linear and inversely related. This curve was used to estimate the constant K for pullulan with a known exponent a. Among various reported solvents, the diluted aqueous salt solns. have more advantages than other solvents.
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 2 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2006:402612 CAPLUS
DOCUMENT NUMBER: 145:69929
TITLE: Method for manufacturing 5-fluorouracil-loaded pH-sensitive controlled-release nanoparticle
INVENTOR(S): Liu, Liang; Zhang, Guoliang; Zhang, Fengbao; Wang, Shulan
PATENT ASSIGNEE(S): Tianjin University, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 8 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1723904	A	20060125	CN 2005-10014552	20050718

PRIORITY APPLN. INFO.: CN 2005-10014552 20050718
AB The title nanoparticle has a core/shell structure with a size of 50-200 nm, wherein the shell is modified pullulan-sulfadimethoxine, and the core is the acetyl moiety of the modified pullulan. The nanoparticle can aggregate dramatically and release the loaded 5-fluorouracil at pH 6.6-6.9, and can realize controlled release and maintain the particle size at pH of 7.4 or higher. The encapsulation efficiency of the nanoparticle exceeds 80%. The title method comprise (1)

preparing a 10-15% formamide solution of pullulan (MW 100,000-200,000), adding acetic anhydride and reacting under 50-54ÅC for 48-50 h, and washing to obtain modified pullulan, (2) preparing 10-20% modified pullulan solution in 1,4-dioxane, adding succinic anhydride, dimethylaminopyridine and triethylamine at a wt. ratio of (10-12) : (8-11) : (8-10) and in a total wt. of 1-1.2 times of the pullulan, and reacting under nitrogen for 24-28 h, (3) evaporating the 1,4-dioxane and removing the unreacted reactants with carbon tetrachloride, (4) concentrating and precipitating with 2-4ÅC Et ether, and vacuum-drying the precipitate at 30-40ÅC, (5) mixing the precipitate with sulfadimethoxine, dicyclohexylcarbodiimide and hydroxysuccinimide at the wt. ratio of (19-21) : (5-7) : (4-6) : (2-4) in anhydride dimethylsulfoxide, and reacting under room temperature for 24 h, (6) filtering and dialyzing the filtrate against distilled water for 3 d, (7) subjecting the solution to freeze-drying-thawing-freeze-drying for three times to obtain acetylated pullulan-sulfadimethoxine, and (8) dissolving the acetylated pullulan-sulfadimethoxine and 5-fluorouracil in dimethylsulfoxide and dialyzing against water to allow the self-assembly of the desired nanoparticles.

L13 ANSWER 3 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:393564 CAPLUS
DOCUMENT NUMBER: 145:354790
TITLE: Continuous production of pullulan by Aureobasidium pullulans HP-2001 with feeding of high concentration of sucrose
AUTHOR(S): Seo, Hyung-Phil; Jo, Kang-Ik; Son, Chang-Woo; Yang, Jae-Kyoon; Chung, Chung-Han; Nam, Soo-Wan; Kim, Sung-Koo; Lee, Jin-Woo
CORPORATE SOURCE: Division of Applied Biotechnology, College of Natural Resources & Life Science, Dong-A University, Pusan, 604-714, S. Korea
SOURCE: Journal of Microbiology and Biotechnology (2006), 16(3), 374-380
CODEN: JOMBES; ISSN: 1017-7825
PUBLISHER: Korean Society for Microbiology and Biotechnology
DOCUMENT TYPE: Journal
LANGUAGE: English
AB In this study, glucose, sucrose, and dextrin were found to be better carbon sources for the production of pullulan by Aureobasidium pullulans HP-2001. Maximal production of pullulan with 200 g/l sucrose as a carbon source was 54.2 g/l. The highest yield of pullulan from sucrose was 0.40, when the sugar concentration was 100 g/l. Optimal conditions for the continuous production of pullulan by A. pullulans HP-2001 in a 7-1 bioreactor were determined by studying the effects of composition of feed solution, dilution rate, and concentration of sucrose in the feed solution Pullulan concentration and productivity with 100 g/l glucose and 2.5 g/l yeast extract were 38.1 g/l and 0.53 g/l·h for 72 h, resp., in a batch culture of A. pullulans HP-2001. When the substituted medium contained 100 g/l sucrose, 2.5 g/l yeast extract, and mineral salts, which is the same composition as the medium for the production of pullulan, the pullulan concentration and productivity were 74.9 g/l and 0.55 g/l·h for 120 h, resp. The production of pullulan at the steady state increased with a dilution rate up to 0.015/h, and its concentration was 78.4 g/l with a wt. average mol. wt. (Mw) of 4.0+105. Unlike a batch culture, however, the decline of the Mw and the number average mol. wt. (Mn) of pullulan was not found in the continuous culture of A. pullulans HP-2001. When the concentration of sucrose in the feed solution was 200 g/l, 113.5 g/l of pullulan was obtained at the steady state. The steady state was maintained longer in the continuous culture fed with the feed solution containing

200 g/l sucrose than when fed with the feed solns. containing either 100 or 150 g/l sucrose.

REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 4 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:780598 CAPLUS
DOCUMENT NUMBER: 143:346165
TITLE: Pullulans and γ-cyclodextrin affect apparent digestibility and metabolism in healthy adult ileal cannulated dogs
AUTHOR(S): Spears, Julie K.; Karr-Lilienthal, Lisa K.; Grieshop, Christine M.; Flickinger, Elizabeth A.; Wolf, Bryan W.; Fahey, George C., Jr.
CORPORATE SOURCE: Department of Animal Sciences, University of Illinois, Urbana, IL, 61801, USA
SOURCE: Journal of Nutrition (2005), 135(8), 1946-1952
CODEN: JONUAI; ISSN: 0022-3166
PUBLISHER: American Society for Nutritional Sciences
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Pullulan and γ-cyclodextrin are incompletely digestible, glucose-based, nonstructural carbohydrates synthesized by microorganisms. To determine their effect when incorporated into a complete liquid diet on ileal and total tract nutrient digestibility, ileal cannulated dogs (n = 8) were used in a repeated 4+4 Latin-square design. Twice daily, diets were offered containing 30% (DMB) maltodextrin, high-mol.-wt. (MW) pullulan (MW 100,000), low-MW pullulan (MW 6300), or γ-cyclodextrin. Fecal and ileal samples were collected for the last 4 d of each 10-d period. Dogs consuming high-MW pullulan had lower ($P < 0.05$) dry matter, organic matter, crude protein, fat, carbohydrate ileal and total tract digestibilities, and fecal DM, and higher ($P < 0.05$) fecal output and fecal scores (indicating looser stools). To evaluate glycemic and insulinemia responses to pullulans, food-deprived dogs consumed 25 g maltodextrin, high-MW pullulan, or low-MW pullulan in a repeated 3+3 Latin-square design. Glucose and insulin responses were determined for 180 min. Consumption of 25 g α-, β-, and γ-cyclodextrin resulted in regurgitation within 60 min. High-MW pullulan reduced ($P < 0.05$) blood glucose concentration at 15, 30, 45, and 60 min. Compared with maltodextrin, low-MW pullulan and γ-cyclodextrin did not alter nutrient digestibilities or fecal characteristics to any extent, and low MW pullulan did not affect glycemic response. Although high MW pullulan decreased glycemic response, consumption of large amts. neg. affected nutrient digestibility and fecal characteristics.

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 5 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:241716 CAPLUS
DOCUMENT NUMBER: 142:463043
TITLE: Size and shape of soil humic acids estimated by viscosity and molecular weight
AUTHOR(S): Kawahigashi, Masayuki; Sumida, Hiroaki; Yamamoto, Kazuhiko
CORPORATE SOURCE: College of Bioresource Science, Nihon University, Fujisawa, Kanagawa, 252-8510, Japan
SOURCE: Journal of Colloid and Interface Science (2005), 284(2), 463-469
CODEN: JCISA5; ISSN: 0021-9797
PUBLISHER: Elsevier

DOCUMENT TYPE: Journal
LANGUAGE: English
AB Ultrafiltration fractions of three soil humic acids were characterized by viscometry and high-performance size-exclusion chromatog. (HPSEC) in order to estimate shapes and hydrodynamic sizes. Intrinsic viscosities under given solute/solvent/temperature conditions were obtained by extrapolating the concentration dependence of reduced viscosities to zero concentration Mol. mass (wt. average mol. wt. (Mw) and number average mol. wt. (Mn)) and hydrodynamic radius (RH) were determined by HPSEC using pullulan as calibrant. Values of Mw and Mn ranged from 15 to 118 + 103 and from 9 to 50 + 103 (g mol-1), resp. Polydispersity, as indicated by Mw/Mn, increased with increasing filter size from 1.5 to 2.4. The hydrodynamic radii (RH) ranged between 2.2 and 6.4 nm. For each humic acid, Mw and [η] were related. Mark-Houwink coeffs. calculated on the basis of the Mw-[η] relationships suggested restricted flexible chains for two of the humic acids and a branched structure for the third humic acid. Those structures probably behave as hydrated sphere colloids in a good solvent. Hydrodynamic radii of fractions calculated from [η] using Einstein's equation, which is applicable to hydrated sphere colloids, ranged from 2.2 to 7.1 nm. These dimensions are fit to the size of nanospaces on and between clay minerals and micropores in soil particle aggregates. On the other hand, the good agreement of RH values obtained by applying Einstein's equation with those directly determined by HPSEC suggests that pullulan is a suitable calibrant for estimation of mol. mass and size of humic acids by HPSEC.
REFERENCE COUNT: 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 6 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:756864 CAPLUS
DOCUMENT NUMBER: 141:238821
TITLE: Pullulan degrading enzyme of Aureobasidium pullulans hydrolyzing α-1,4-glucosidic bond and use for producing pullulan with low viscosity
INVENTOR(S): Mukai, Kazuhisa; Kubota, Michio; Fukuda, Shigeharu; Miyake, Toshio
PATENT ASSIGNEE(S): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Japan
SOURCE: PCT Int. Appl., 35 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004078959	A1	20040916	WO 2004-JP2567	20040302
W: AE, AE, AG, AL, AL, AM, AM, AM, AT, AT, AU, AZ, AZ, BA, BB, BG, BG, BR, BR, BW, BY, BY, BZ, BZ, CA, CH, CN, CN, CO, CO, CR, CR, CU, CU, CZ, CZ, DE, DE, DK, DK, DM, DZ, EC, EC, EE, EE, EG, ES, ES, FI, FI, GB, GD, GE, GE, GH, GM, HR, HR, HU, HU, ID, IL, IN, IS, KE, KE, KG, KG, KP, KP, KP, KR, KR, KZ, KZ, KZ, LC, LK, LR, LS, LS, LT, LU, LV, MA, MD, MD, MG, MK, MN, MW, MX, MX, MZ, MZ, NA, NI, NI, NO				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
JP 2004261132	A2	20040924	JP 2003-56474	20030304

PRIORITY APPLN. INFO.: JP 2003-56474 A 20030304
AB A novel pullulan degrading enzyme; use for its production using a

microorganism of Aureobasidium Genus; use for degrading pullulan ; and use for producing pullulan with low viscosity and/or its polydispersity index (Mw/Mn ratio). The novel pullulan degrading enzyme can be used for production a pullulan which has a low viscosity and a small wt. average mol. wt./number average mol. wt. ratio and is easy to handle. A novel pullulan degrading enzyme was isolated from Aureobasidium pullulans using hydrophobic chromatog., and anion exchange chromatog. The enzyme showed activity toward 63-O-α-glucosylmaltotriose, 64-O-α-glucosylmaltotetraose, 65-O-α-glucosylmaltopentaose, 63-O-α-maltotriosylmaltotriose, 63-O-α-(63-O-α-maltotriosylmaltotriosyl)-maltotriose, and pullulan, hydrolyzing α-1,4-glucosidic bond at the reducing end next to the α-1,6-glucosidic bond. Its activity was inhibited by 1 mM Hg^{2+}, Pb^{2+}, and Fe^{3+}.

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 7 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:158192 CAPLUS
DOCUMENT NUMBER: 140:344740
TITLE: Synthesis of Ultrasmall Superparamagnetic Iron Oxides Using Reduced Polysaccharides
AUTHOR(S): Paul, Kenneth G.; Frigo, Timothy B.; Groman, Jesse Y.; Groman, Ernest V.
CORPORATE SOURCE: Advanced Magnetics Inc., Cambridge, MA, 02138-1038, USA
SOURCE: Bioconjugate Chemistry (2004), 15(2), 394-401 CODEN: BCCHES; ISSN: 1043-1802
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Investigation into the effect of the reducing sugar of dextran on formation and stability of dextran-coated ultrasmall superparamagnetic iron oxides (USPIO) has demonstrated that reduction of the terminal reducing sugar can have a significant effect on particle size, coating stability, and magnetic properties. Four aspects of polysaccharide-coated USPIO particle synthesis were investigated: (i) the effect reduction of the terminal polysaccharide sugar has upon polysaccharide usage, particle size, stability, and magnetic susceptibility; (ii) the effect an exogenous reducing sugar can have upon particle synthesis; (iii) the effect the mol. wt. of the reduced polysaccharide has on particle synthesis; and (iv) the effectiveness of reduced and native dextrans in stabilizing a preformed magnetic soluble For low mol. wt. dextrans (MW ≤10 kDa), reduction resulted in a 10 fold or greater decrease in the carbohydrate-to-iron ratio necessary during particle formation to produce the desired particle size (<20 nm). Particles prepared at the equivalent dextran-to-iron ratio using the equivalent native dextrans yielded larger particles except for a 70 kDa dextran where reduced and native dextran yielded identical particles with respect to size and magnetic properties. The stability of particle size and coating was studied using 10 kDa native and reduced dextran. Particles prepared with reduced dextran yielded a more stable coating as evidenced by stability on autoclaving. For native dextrans (MW < 70 kDa), small (≤30 nm) particles could be obtained at much higher dextran-to-iron ratios, but only the 10 kDa dextran gave a particle with comparable magnetic properties (susceptibility > 20 000 + 10-6 cgs). Similar results were obtained with a 12 kDa pullulan. The effect of polysaccharide mol. wt. on particle size was studied, wherein higher mol. wt. reduced dextrans produced larger particles. The effectiveness of the reduced and native dextrans in stabilizing a preformed magnetic sol was compared. Reduced dextrans were found to be superior for stabilizing the magnetic soluble The observed effects of reduction of the terminal sugar in dextran

compared with the native dextran were modeled using the Langmuir adsorption isotherm. A good fit of exptl. data with this model was found.
REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 8 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:788093 CAPLUS
DOCUMENT NUMBER: 140:275831
TITLE: Recent trends in the use of polysaccharides for improved delivery of therapeutic agents: Pharmacokinetic and pharmacodynamic perspectives
AUTHOR(S): Mehvar, Reza
CORPORATE SOURCE: School of Pharmacy, Texas Tech University Health Sciences Center, Amarillo, TX, 79106, USA
SOURCE: Current Pharmaceutical Biotechnology (2003), 4(5), 283-302
CODEN: CPBUBP; ISSN: 1389-2010
PUBLISHER: Bentham Science Publishers Ltd.
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English
AB A review. New and innovative methods of delivery of therapeutic agents using polysaccharides were recently developed, which target site of action, increase the intensity and/or prolong pharmacol. action, and/or reduce toxicity of small mol. drugs, proteins, or enzymes. This review is focused on the role of dextran, pullulan, and mannan polysaccharides in such applications. While dextran and pullulan are glucose polymers with different glucosidic linkages, mannan is composed of mannose units. In terms of pharmacokinetics of the carriers themselves, mol. wt. (MW), elec. charge, various chemical modifications, and degree of polydispersity and/or branching would mostly determine their fate in vivo. Generally, large MW polysaccharides (MWs $\geq$ 40 kD) have low clearance and relatively long plasma half life, resulting in accumulation in reticuloendothelial or tumor tissues. The tumor accumulation in most cases is a passive targeting due to "enhanced permeation and retention" of macromols. by tumors. Addnl., drugs such as anticancer agents may be actively targeted to specific cells by polysaccharides to which appropriate ligands are attached. In terms of mode of use, polysaccharides were utilized in a variety of innovative ways for improvement of drug delivery. Their most important application was as carriers for preparation of macromol. prodrugs that are normally inactive and need to release the active drug at the site(s) of interest. Also, they were used for preparation of macromol.-protein conjugates, which may retain the activity of the proteins, to increase the duration of effect and decrease the immunogenicity of proteins. Several other new applications, such as polysaccharide-anchored liposomal formulations, were also gained attention recently and are briefly reviewed here. Finally, 4 recent examples of polysaccharide-based delivery systems involving specific drugs/imaging agents are reviewed in detail in terms of their development, pharmacokinetics, and pharmacodynamics. Collectively, these data suggest that macromol. polysaccharides are promising agents for improving drug delivery.
REFERENCE COUNT: 101 THERE ARE 101 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 9 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:721195 CAPLUS
DOCUMENT NUMBER: 140:41137
TITLE: Preparation and characterization of molecular weight standards of low polydispersity from oat and barley (1 $\rightarrow$ 3)(1 $\rightarrow$ 4)-β-D-glucan
AUTHOR(S): Wang, Q.; Wood, P. J.; Huang, X.; Cui, W.
CORPORATE SOURCE: Food Research Program, Agriculture and Agri-Food Canada, Guelph, ON, N1G 5C9, Can.

SOURCE: Food Hydrocolloids (2003), 17(6), 845-853
CODEN: FOHYES; ISSN: 0268-005X
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Purified (1→3)(1→4)-β-D-glucans (β-glucans) from oat and barley with broad mol. wt. (MW) distribution were separated into seven fractions using gradient precipitation with ammonium sulfate (NH4)2SO4. The MW of each fraction decreased consecutively with the concentration of (NH4)2SO4 at which it was precipitated The MW distribution of each fraction was much narrower compared to the parent sample and is comparable to com. available pullulan MW stds. To determine whether the fractionation process was separating sub-fractions of different structure, the original β-glucan sample and each fraction were hydrolyzed by a (1→3)(1→4)-D-β-glucan-4-glucanohydrolase (lichenase, E.C.3.2.1.73) and the liberated oligosaccharides were analyzed by high performance anion exchange chromatog. The anal. revealed no differences in oligosaccharide pattern (DP 2-9) derived from each fraction and the parent sample. In particular, the tri/tetra oligosaccharide ratio remained constant for all fractions, indicating no fractionation based on structural features had taken place. The effect of starting β-glucan concentration on the fractionation process was studied. The results showed that it was possible to achieve good separation at overlapping parameter c[η] lower than .apprx.3.5. Further increase in starting β-glucan concentration hindered clear separation of the fractions. Temperature also affected the fractionation efficiency. The higher the temperature, the lower the amount of (NH4)2SO4 that was necessary to precipitate the samples of same MW. A Mark Houwink relationship was derived from the measured MW and intrinsic viscosity for fractions from oat and barley, resp.

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 10 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:636609 CAPLUS
TITLE: Elaboration and characterization of matrixes based on polysaccharide for entrapment applications
AUTHOR(S): Lack, Stephane; Picton, Luc; Le Cerf, Didier; Dulong, Virginie; Argillier, Jean-Francois; Glinel, Karine; Muller, Guy
CORPORATE SOURCE: UMR 6522, Polymeres, Biopolymeres, Membranes, CNRS-Universite de Rouen, Mont Saint Aignan, F-76821, Fr.
SOURCE: Abstracts of Papers, 226th ACS National Meeting, New York, NY, United States, September 7-11, 2003 (2003), PMSE-226. American Chemical Society: Washington, D. C.
CODEN: 69EKY9
DOCUMENT TYPE: Conference; Meeting Abstract
LANGUAGE: English

AB Polysaccharides show an increasing interest due to their biocompatible and/or biodegradable characteristics. They are currently used in aqueous formulations in food or paint industry due to their thickening, gelling, emulsifying or stabilizing properties. Another promising application of polysaccharides is the preparation of biocompatible hydrogels for drug delivery systems. These matrixes can be synthesized by phys. or chemical crosslinking. In this paper we report on the preparation and the entrapment/release behavior of hydrogels based on pullulan, a linear exopolysaccharide. These hydrogels are synthesized by crosslinking pullulan chains with various amount of trisodium trimethaphosphate (STMP) in alkaline media. By contrast with epichlorydrin largely used for

hydrogel preparation, the STMP is non toxic for human. The crosslinking process results in the neg. charged polymer network sensitive to the pH and the ionic strength. The entrapment/release properties of various matrixes differing by their crosslinking d. and their anionic degree were tested with respect of two model compds., the methylene blue (M=374 g.mol-1) and the polyethyleneimine (Mw=10 000 g.mol-1). We showed that the release behavior of these matrixes is a function of their charge d., their crosslinking d., the ionic strength and the mol. wt. of the entrapped compound

L13 ANSWER 11 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:86678 CAPLUS
DOCUMENT NUMBER: 138:339909
TITLE: Molecular weight effects on solution rheology of pullulan and mechanical properties of its films
AUTHOR(S): Lazaridou, Athina; Biliaderis, Costas G.; Kontogiorgos, Vassilis
CORPORATE SOURCE: School of Agriculture, Laboratory of Food Chemistry and Biochemistry, Food Science and Technology Department, Aristotle University, Thessaloniki, 54006, Greece
SOURCE: Carbohydrate Polymers (2003), 52(2), 151-166
CODEN: CAPOD8; ISSN: 0144-8617
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The effects of mol. wt. on solution rheol. of pullulan, and on thermomech. properties of sorbitol and(or) water-plasticized pullulan specimens, prepared by either hot pressing or casting of aqueous solns., were studied. Pullulan samples differing in mol. wt. were characterized by 13C NMR spectroscopy and SEC combined with a multi-angle laser light scattering and a refractive index detector. For samples with wt. average mol. wt. (Mw) ranging between 100 and 560 + 103, the values of limiting viscosity ([η]), critical concentration (c*), and coil overlap parameter (c*[η]) were within the range 0.38-0.70 dL/g, 1.4-3.1 g/dL and 1.0-1.2 dL/g, resp. The thermomech. properties of 5 mol. wt. grades of pullulan , either alone or with sorbitol (plasticized at a 10% d.b. level) were examined by dynamic mech. thermal anal. (DMTA). A large drop in storage modulus E' (.apprx.101.5-103 Pa) and a peak in tan δ in the DMTA traces accompanied the glass-rubber transition (Tg) or the α-relaxation (Tα) of pullulan; the magnitude of the drop in E' and the tan δ peak height increased with increasing water content. The plasticizing action of water and sorbitol was evident in the DMTA curves, and the Tg vs. moisture content data were fitted to the Gordon-Taylor empirical model. Within the range of mol. wts. tested, there was no effect of polymer mol. wt. on Tg. A β-relaxation detected by DMTA was shifted to lower temperature with increasing moisture content and to higher temperature with addition of sorbitol.
Apparent activation energies for α-relaxation (Eαα) and β-relaxation (Eαβ) processes, estimated from multi-frequency measurements, were within 171-640 and 118-256 kJ/mol, resp.; the values for Eαα and fragility' parameter decreased with increasing moisture content. Anal. of viscoelasticity data using the time-temperature superposition principle with the Williams-Landel-Ferry equation was successful over the range Tg to Tg + 40°, provided that the coeffs. C1 and C2 are optimized and not allowed to assume their universal' values. Large deformation mech. tests demonstrated large decreases in tensile (Young's) modulus (E) and strength (σmax), and an increase in percentage elongation with increasing water content and(or) addition of sorbitol in pullulan films. Relationships between the tensile parameters (E and σmax) and water content showed an increase in stiffness of the films from 3 to 7% moisture, and a strong softening

effect at higher water contents. The tensile tests revealed some relationships between mech. properties under uniaxial load and the mol. characteristics of pullulan, e.g. E, σmax, and elongation values increased with increasing mol. wt.

REFERENCE COUNT: 89 THERE ARE 89 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 12 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:959853 CAPLUS
DOCUMENT NUMBER: 139:19151
TITLE: Determination of molecular weight of heparin by size exclusion chromatography with universal calibration
AUTHOR(S): Guo, X.; Condra, M.; Kimura, K.; Berth, G.; Dautzenberg, H.; Dubin, P. L.
CORPORATE SOURCE: Department of Chemistry, Indiana University-Purdue University, Indianapolis, IN, 46202-3274, USA
SOURCE: Analytical Biochemistry (2003), 312(1), 33-39
CODEN: ANBCA2; ISSN: 0003-2697
PUBLISHER: Elsevier Science
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The mol. wt. (MW) of heparin can be accurately determined by size exclusion chromatog. using "universal calibration.". A universal calibration curve was constructed for Superose 12 with standard pullulan samples and verified using characterized ficoll fractions. This calibration yielded the correct MW of heparin as determined by light scattering, when the ionic strength of the mobile phase was maintained over 1.0 M. Sodium poly(styrenesulfonate) samples were not suitable stds. because of adsorption at high salt concentration and repulsion from the packing material at low ionic strength. The extraordinarily high charge d. of heparin leads to the need for high salt concentration to screen such repulsions.

REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 13 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:442446 CAPLUS
DOCUMENT NUMBER: 137:277880
TITLE: Characterization of pullulan produced from beet molasses by Aureobasidium pullulans in a stirred tank reactor under varying agitation
AUTHOR(S): Lazaridou, A.; Roukas, T.; Biliaderis, C. G.; Vaikousi, H.
CORPORATE SOURCE: School of Agriculture, Department of Food Science and Technology, Laboratory of Food Chemistry and Biochemistry, Aristotle University of Thessaloniki, Thessaloniki, 540 06, Greece
SOURCE: Enzyme and Microbial Technology (2002), 31(1-2), 122-132
CODEN: EMTED2; ISSN: 0141-0229
PUBLISHER: Elsevier Science Ireland Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The mol. characteristics of pullulan produced from beet molasses, following their pretreatment with sulfuric acid and activated carbon, by Aureobasidium pullulans P56 (a melanin-deficient strain) in a stirred tank fermentor under varying agitation conditions have been examined A maximum pullulan concentration of 49 g/L, biomass dry wt. of 25 g/L, pullulan yield of 50% and sugar utilization of 97% were achieved at an initial sugar concentration in the medium of 100 g/L and impeller speed of 700 rpm; under these conditions the pO2 levels in the bioreactor were maintained at low levels of dissolved O2 saturation (.apprx.7%).

Structural characterization of the isolated polysaccharides from the fermentation broths by 13C NMR spectroscopy and pullulanase digestion combined with size exclusion chromatog. confirmed the identity of pullulan and the homogeneity (>94% d.b.) of the elaborated polysaccharides by the microorganism. The exopolysaccharide prepns. were also free of contaminating proteins. Using multiangle laser light scattering (MALLS) and refractive index (RI) detectors, in conjunction with high-performance size-exclusion chromatog. (HPSEC), mol. size distributions and ests. of the mol. wt. (Mw=5.3-14.7+104), root-mean square of the radius of gyration (Rg=24-33 nm) and polydispersity index (Mw/Mn=1.7-2.6) were obtained. In most culture systems examined there was a reduction in the mol. size of the isolated polysaccharides as time of fermentation progressed. In the concentration range of 2.8-9.5% (w/v), the solution rheol. behavior of the isolated pullulans was almost Newtonian (within 1 and 1200 s-1 at 20 °C). Overall, beet molasses were proven as an attractive fermentation medium for the production of pullulan by A. pullulans.

REFERENCE COUNT: 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 14 OF 35 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:250219 CAPLUS

DOCUMENT NUMBER: 137:5070

TITLE: Optimization of high molecular weight pullulan production by Aureobasidium pullulans in batch fermentations

AUTHOR(S): Gibson, Larry H.; Coughlin, Robert W.

CORPORATE SOURCE: Department of Chemical Engineering, University of Connecticut, Storrs, CT, 06269, USA

SOURCE: Biotechnology Progress (2002), 18(3), 675-678
CODEN: BIPRET; ISSN: 8756-7938

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Of 5 strains of A. pullulans studied, NRRL Y-2311-1 yielded the highest titer (26.2 g/L) of pullulan and formed the lowest amount of melanin-like pigment. Sucrose was superior to glucose as the C and energy source on the basis of yield and titer of pullulan produced. Pullulan titer was higher (26.2 vs 5.1 g/L), biomass concentration was lower (6.9 vs 12.7 g/L), and DO was lower (0 vs 60% of saturation) when the fermenter was agitated by a marine propeller compared to Rushton impellers. Pullulan produced by strain NRRL Y-2311-1 ranged in wt.-average molar mass (Mw) from 486 KDa and number-average molar mass (Mn) from 220 Da on day 1 of growth to 390 KDa and 690 Da on day 6; Mw declined by about 35% from day 1 to day 3, the day of maximum pullulan titer. For the other strains, the ranges of molar mass on the day of maximum pullulan titer were 338-614 KDa (Mw) and 100-6820 Da (Mn).

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 14 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:27220 CAPLUS
DOCUMENT NUMBER: 120:27220
TITLE: Optimization of pH for high-molecular-weight pullulan
AUTHOR(S): Lee, Ki Young; Yoo, Young Je
CORPORATE SOURCE: Dep. Chem. Eng., Seoul Natl. Univ., Seoul, 151-742, S. Korea
SOURCE: Biotechnology Letters (1993), 15(10), 1021-4
CODEN: BILED3; ISSN: 0141-5492
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Pullulan is a polysaccharide produced by Aureobasidium pullulans. The effect of pH on the mol. wt. of pullulan was investigated. A high concentration of pullulan was obtained when the initial pH was 6. Pullulan with mol. wt. 500,000-600,000 was produced at an initial pH of 3.0, while pullulan with a mol. wt. of 200,000-300,000 was produced at pH values above 4.5. To obtain high-mol.-wt. pullulan in high concentration, the pH was initially controlled at pH 6, followed by a shift from pH 6 to pH 3. A shift in pH after 2 days of fermentation was optimal. Higher-mol.-wt. pullulan was also obtained when the sucrose concentration was 50 g/L compared to the result obtained at an initial sucrose concentration of 20 g/L. The sucrose concentration and pH of the fermentation broth seem to be important parameters in obtaining high-mol.-wt. pullulan.

L20 ANSWER 15 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:537428 CAPLUS
DOCUMENT NUMBER: 119:137428
TITLE: Effect of pH and its optimization for high molecular weight of pullulan
AUTHOR(S): Lee, Ki Young; Yoo, Young Je
CORPORATE SOURCE: Dep. Chem. Technol., Chonnam Natl. Univ., Kwangju, S. Korea
SOURCE: Biochem. Eng. 2001, Proc. Asia-Pac. Biochem. Eng. Conf. (1992), 212-14. Editor(s): Furusaki, Shintaro; Endo, Isao; Matsuno, Ryuichi. Springer: Tokyo, Japan.
CODEN: 58ZEAK
DOCUMENT TYPE: Conference
LANGUAGE: English
AB The effect of pH on the mol. wt. of pullulan was studied. To obtain high mol. wt. of pullulan with high concentration, pH was initially controlled at pH 6, then pH was shifted from pH 6 to pH 3 and sucrose (50 g/L) was added to supply the carbon source for pullulan biosynthesis. By following this strategy, 22 g/L pullulan with the mol. wt. of 500,000-600,000 was obtained. Optimal pH transition time was searched by expts. and simulation, which showed transition at 2 days of fermentation gave better results. The pH and sucrose concentration of the fermentation broth seem to be important parameters to obtain high-mol.-wt. pullulan.

L20 ANSWER 16 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:232389 CAPLUS
DOCUMENT NUMBER: 118:232389
TITLE: High molecular weight pullulan manufacture with novel Aureobasidium pullulans strains
INVENTOR(S): Thorne, Linda P.; Pollock, Thomas J.; Armentrout, Richard W.
PATENT ASSIGNEE(S): Shin-Etsu Bio, Inc., USA; Shin-Etsu Chemical Co., Ltd.

SOURCE: Eur. Pat. Appl., 25 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 538049	A1	19930421	EP 1992-309456	19921016
EP 538049	B1	19980128		
R: CH, DE, FR, GB, LI				
US 5268460	A	19931207	US 1991-777151	19911016
US 6010899	A	20000104	US 1992-841707	19920226
CA 2080658	AA	19930417	CA 1992-2080658	19921015
CA 2080658	C	19980811		
JP 05331202	A2	19931214	JP 1992-304794	19921016
JP 3071583	B2	20000731		
EP 812919	A1	19971217	EP 1997-202095	19921016
EP 812919	B1	20000405		
R: CH, DE, FR, GB, LI				
US 6387666	B1	20020514	US 1993-159939	19931130

PRIORITY APPLN. INFO.:
US 1991-777151 A 19911016
US 1992-841716 B1 19920226
EP 1992-309456 A3 19921016

AB Strains of A. pullulans that preferably grow as yeasts and with lowered levels of pigment are prepared by mutagenesis and selection and used to prepare high mol. wt. (≥106) pullulan. To prevent breakdown of the pullulan, the pH of the fermentation broth is adjusted to pH 7 after the fermentation has reached the point where the pH has stabilized at an acid pH. The crude product is also heat treated to inactivate degradative enzyme(s).

L20 ANSWER 17 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:167512 CAPLUS
DOCUMENT NUMBER: 118:167512
TITLE: Control of molecular weight distribution of the biopolymer pullulan produced by Aureobasidium pullulans
AUTHOR(S): Wiley, B. J.; Ball, D. H.; Arcidiacono, S. M.; Sousa, S.; Mayer, J. M.; Kaplan, D. L.
CORPORATE SOURCE: Biotechnol. Div., U.S. Army Natick Res. Dev. Eng. Cent., Natick, MA, 01760-5020, USA
SOURCE: Journal of Environmental Polymer Degradation (1993), 1(1), 3-9
CODEN: JEPDED; ISSN: 1064-7546
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The effects of C, N, and P sources, along with concentration, were determined on the wt. average mol. wt., mol. wt. distribution, and yield of pullulan produced by A. pullulans NRRL-Y 6220. Batch systems, scale-up batch, and continuous fermns. of 1 L and 10 L were also evaluated, as were processing variables, including solvents and extraction conditions. Products with wt. average mol. wt. from 1.0 + 105 to 4.0 + 106 were produced in 100-g quantities by varying fermentation conditions such as constituents of the culture medium, pH, and length of incubation. Three sets of culture conditions were defined for the formation of low (<5.0 + 105), medium (1.0-2.0 + 106), and high (>2.0 + 106) wt. average mol. wt. polymer. These defined mol. wt. fractions of pullulan were used in further studies in producing films and fibers.

L20 ANSWER 18 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1993:119351 CAPLUS
DOCUMENT NUMBER: 118:119351
TITLE: Pullulan molecular weight enzymic determination
INVENTOR(S): Inoue, Yukie; Hayashi, Ryuzo
PATENT ASSIGNEE(S): Kanzaki Paper Mfg. Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 04360699	A2	19921214	JP 1991-134284	19910605
PRIORITY APPLN. INFO.:			JP 1991-134284	19910605

AB The mol. wt. of pullulan (I) is determined by degradation of I with glucoamylase to give glucose, which in turn can be measured using an enzyme electrode containing immobilized glucose oxidation/reduction enzyme(s). The amount of glucose formation reflect the mol. wt. of I, i.e. less glucose formation means higher mol. wt. of I or vice versa. The method is easy, highly sensitive, and fast. Also given was a diagram of the apparatus for determination of mol. wt. of I.

L20 ANSWER 19 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1992:172365 CAPLUS
DOCUMENT NUMBER: 116:172365
TITLE: Isolation of new Aureobasidium strains that produce high-molecular-weight pullulan with reduced pigmentation
AUTHOR(S): Pollock, Thomas J.; Thorne, Linda; Armentrout, Richard W.
CORPORATE SOURCE: Shin-Etsu Bio, Inc., San Diego, CA, 92121, USA
SOURCE: Applied and Environmental Microbiology (1992), 58(3), 877-83
CODEN: AEMIDF; ISSN: 0099-2240
DOCUMENT TYPE: Journal
LANGUAGE: English
AB New isolates of Aureobasidium pullulans were obtained from plant leaf surfaces. The new fungal isolates were identified as A. pullulans on the basis of the appearance of polymorphic colonies formed on agar plates, the electrophoretic profiles of repeated genomic DNA sequences, and the production of pullulan in shake flask cultures. The isolates showed different degrees of pigmentation. One of the natural isolates was nonpigmented under mock production conditions in liquid culture, but still synthesized a reduced amount of pigment on agar plates at late times. A mutagenic treatment with ethidium bromide produced derivs. of normally pigmented natural isolates that exhibited an increased tendency toward yeastlike growth and reduced pigmentation. Addnl., some of the new isolates and mutant derivs. accumulated pullulan of relatively high mol. wt. in the culture broths.

L20 ANSWER 20 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1989:546497 CAPLUS
DOCUMENT NUMBER: 111:146497
TITLE: Impact of molecular weight characteristics of pullulan on its hemodynamic efficiency
AUTHOR(S): Alekseeva, G. S.; Telkova, T. N.; Yarovaya, S. M.; Chlenov, M. A.; Yanin, V. A.; Dombrovskii, V. A.
CORPORATE SOURCE: VNII Tekhnol. Krovezamenitel. Gormon. Prepar., Moscow, USSR
SOURCE: Khimiko-Farmatsevticheskii Zhurnal (1989), 23(7),

789-94
CODEN: KHFZAN; ISSN: 0023-1134
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The mol. wt. distribution in pullulan, a bacterial polysaccharide from Pullularia pullulans used as blood plasma substitute, was studied by HPLC in vitro and in vivo. The rate of its hydrolysis was evaluated during incubation with pancreatic α-amylase and blood plasma, and during treatment in dogs with severe hemorrhagic shock. Large proportions of high-mol.-wt. fractions increased the hemodynamic efficiency of pullulan. The preparation should be carefully fractionated for intended use to regulate its circulation time. Excessive content of low-mol.-wt. fractions decreases the hemodynamic effect, increases osmotic diuresis, and can cause osmotic nephritis.

L20 ANSWER 21 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1989:111400 CAPLUS
DOCUMENT NUMBER: 110:111400
TITLE: Control of molecular weight distribution of the biopolymer pullulan produced by the fungus Aureobasidium pullulans
AUTHOR(S): Wiley, B. J.; Arcidiacono, S.; Sousa, S.; Mayer, J. M.; Kaplan, D. L.
CORPORATE SOURCE: Army Natick Res. Dev. Cent., MA, USA
SOURCE: Report (1987), NATICK/TR-88/012; Order No. AD-A191040, 29 pp. Avail.: NTIS
From: Gov. Rep. Announce. Index (U. S.) 1988, 88(15), Abstr. No. 839,129
DOCUMENT TYPE: Report
LANGUAGE: English
AB The evaluation of environmental conditions on pullulan mol. wt. distribution and yield is reported. Preliminary studies utilized cell suspensions of 9 strains of A. pullulans. A. pullulans NRRL-Y 6220 was selected for further study. C and N sources along with phosphate concentration were evaluated for their effects. Batch systems, including solvents, extraction time, etc., were also studied. Pullulan biopolymer products with wt. average mol. wts. of 105 to 4 + 106, with a dispersity of .apprx.2, were produced. The evaluation of chemical/phys. properties of defined mol. wt. fractions of pullulan is now under investigation.

L20 ANSWER 22 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1987:423618 CAPLUS
DOCUMENT NUMBER: 107:23618
TITLE: Temperature and molecular weight dependence of the unperturbed dimensions of aqueous pullulan
AUTHOR(S): Buliga, Gregory S.; Brant, David A.
CORPORATE SOURCE: Dep. Chem., Univ. California, Irvine, CA, 92717, USA
SOURCE: International Journal of Biological Macromolecules (1987), 9(2), 71-6
CODEN: IJBMDR; ISSN: 0141-8130
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The intrinsic viscosities, [η], and light scattering mol. wts., Mw, second virial coeffs., A'2, and root-mean-square radii of gyration, (Sz2)1/2, were measured for a series of pullulan fractions in aqueous solution at 25°. These were used to establish the dependence on mol. wt. of [η], A'2, and (Sz2)1/2 and to deduce the limiting characteristic ratio of the unperturbed mean-square end-to-end distance C∞ (4.3) for aqueous pullulan at this temperature The temperature dependence of C∞ was determined from measurements of the same properties for selected

fractions at a series of temps., and the temperature coefficient dln C∞/dT (-0.0043 deg-1) was established.

L20 ANSWER 23 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1985:406640 CAPLUS
DOCUMENT NUMBER: 103:6640
TITLE: Trends in molecular motion for a series of glucose oligomers and the corresponding polymer pullulan as measured by carbon-13 NMR relaxation
AUTHOR(S): Benesi, Alan J.; Brant, David A.
CORPORATE SOURCE: Dep. Chem., Univ. California, Irvine, CA, 92717, USA
SOURCE: Macromolecules (1985), 18(6), 1109-16
CODEN: MAMOBX; ISSN: 0024-9297
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The dipolar 13C relaxation parameters T1, T2, and NOE were measured at 62.83 MHz for a series of glucose oligomers and the corresponding high mol. wt., linear polymer pullulan. Significant chemical shift differences made it possible to differentiate between 13C atoms in terminal glucose rings, penultimate glucose rings, and interior glucose rings of the oligomers. Terminal and penultimate ring atoms exhibit consistently higher values of T1, T2, and NOE than do interior ring atoms. For each type of ring the 13C relaxation parameters approach a characteristic asymptotic limit at about d.p. = 12. The relaxation parameters of interior ring 13C atoms in the oligomers match those of pullulan at a critical d.p. = 15. Thus, the relative angular motion of interior 13C magnetic moments and their directly bonded 1H magnetic moments generates the same electromagnetic power at the pertinent magnetic resonance frequencies, and suggests that the underlying atomic motion is the same in both cases.

L20 ANSWER 24 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1983:440125 CAPLUS
DOCUMENT NUMBER: 99:40125
TITLE: Pullulan preparation with limited molecular weight distribution for use as a plasma extender and an antihyperkinesis agent
INVENTOR(S): Yoshida, Mikihiko
PATENT ASSIGNEE(S): Hayashi Biochemical Laboratories, Inc., Japan
SOURCE: Ger. Offen., 16 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 3147193	A1	19830601	DE 1981-3147193	19811127
GB 2109391	A1	19830602	GB 1981-34001	19811111
GB 2109391	B2	19850206		
FR 2517326	A1	19830603	FR 1981-22479	19811201
FR 2517326	B1	19890901		
PRIORITY APPLN. INFO.:			DE 1981-3147193	19811127

AB Partial hydrolysis of pullulan (I) in the presence of inorg. acids, enzymes or ultrasound gave product for use as plasma extender or antihyperkinesis agent. Thus, 10% aqueous I [the ratio of wt.-average (Mw) to number-average (Mn) mol. wt. 2.3 (Mw = 300,000)] solution was acidified with HCl to pH .apprx.2, incubated for 2 h at 80°, neutralized with NaOH, purified with MeOH, decolorized with active C and deionized with ion exchanger to give .apprx.90 g hydrolyzed I with Mw/Mn 1.4 and Mw 50,000.

L20 ANSWER 25 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1983:78177 CAPLUS
DOCUMENT NUMBER: 98:78177
TITLE: Pullulan with uniform molecular weights as a blood expander
PATENT ASSIGNEE(S): Hayashibara Biochemical Laboratories, Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 57141401	A2	19820901	JP 1981-156134	19811002
JP 02048561	B4	19901025		
PRIORITY APPLN. INFO.:			JP 1981-156134	19811002

AB Glucans, obtained from Aureobasidium pullulans, are partially degraded and fractionated, and pullulan [9057-02-7] with a wt. average mol. wt. (Mw)/number average mol. wt. (Mn) = <1.5 was isolated as a blood expander. Thus, 200 g pullulan (Mw/Mn = 2.3, Mw = 300,000) in water was partially degraded by HCl at pH 2, neutralized with NaOH, fractionated with MeOH, discolored with activated C, desalted with H-type and OH-type ion exchangers, filtered through a membrane, concentrated, dried, and pulverized to obtain 90 g white powder with Mw/Mn = 1.4 and Mw 50,000.

L20 ANSWER 26 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1982:20401 CAPLUS
DOCUMENT NUMBER: 96:20401
TITLE: Configurational statistics of polysaccharides; molecular weight distributions of pullulan
AUTHOR(S): Burton, Bruce Anthony
CORPORATE SOURCE: Univ. California, Irvine, CA, USA
SOURCE: (1981) 307 pp. Avail.: Univ. Microfilms Int., Order No. 8118463
From: Diss. Abstr. Int. B 1981, 42(3), 1038-9
DOCUMENT TYPE: Dissertation
LANGUAGE: English
AB Unavailable

L20 ANSWER 27 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1977:169314 CAPLUS
DOCUMENT NUMBER: 86:169314
TITLE: Rheological properties of pullulan broths (III). Effect of sucrose concentration on molecular weight of pullulan formed
AUTHOR(S): Miura, Y.; Arima, H.; Ueda, S.
CORPORATE SOURCE: Fac. Agric., Kyushu Univ., Fukuoka, Japan
SOURCE: Hakko Kogaku Kaishi (1977), 55(2), 80-3
CODEN: HKOKDE; ISSN: 0385-6151
DOCUMENT TYPE: Journal
LANGUAGE: Japanese
AB Pullulan [9057-02-7] fermentation by Aureobasidium pullulans was investigated to clarify the effect of sucrose [57-50-1] concentration on the mol. wt. of the pullulan formed. In the culture media containing 2.5, 5, and 10% sucrose, the mol. wt. of the pullulan formed had a maximum value of 5 + 105 after 48 h-cultivation. On further incubation, the mol. wt. decreased gradually and reached 2 + 105 after 144 h. In the case of 15% sucrose, the mol. wt. of the pullulan had a constant value of 5.5 + 105 during the fermentation The enzyme which caused

the decrease in the mol. wt. of the pullulan formed seemed to be inhibited at pH values between 2.3 and 2.5.

L20 ANSWER 28 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1971:494668 CAPLUS
DOCUMENT NUMBER: 75:94668
TITLE: Pullulan, relation between molecular weight and fine structure
AUTHOR(S): Catley, Brian J.
CORPORATE SOURCE: Sch. Med., Univ. Miami, Miami, FL, USA
SOURCE: FEBS Letters (1970), 10(3), 190-3
CODEN: FEBLAL; ISSN: 0014-5793
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Pullulan (I), an extracellular α-glucan isolated from 80 hr cultures of Pullularia pullulans, had a mol. wt. of 2.1 + 106, and on hydrolysis with pullulanase, an enzyme specific for α-1,6-glucosidic bonds, yielded mainly maltotriose, with small amts. of maltotetraose. I from 160 hr cultures had a mol. wt. of 2 + 105, and the maltotetraose hydrolysis product was largely replaced by another tetrasaccharide, probably glucosylmaltotriose or maltotriosylglucose.

> d L20 1-13 ibib abs

L20 ANSWER 1 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2006:448935 CAPLUS
DOCUMENT NUMBER: 145:103893
TITLE: Intrinsic viscosity-molecular weight relationship and hydrodynamic volume for pullulan
AUTHOR(S): Kasaai, Mohammad R.
CORPORATE SOURCE: Faculty of Agriculture, Mazandaran University, Sari, Iran
SOURCE: Journal of Applied Polymer Science (2006), 100(6), 4325-4332
CODEN: JAPNAB; ISSN: 0021-8995
PUBLISHER: John Wiley & Sons, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A numerical method for determination of Mark-Houwink-Sakurada (MHS) equation consts., a and K, was tested with success for two series of pullulan standard samples having narrow and broad mol. wt. distributions (MWD) and taken into account their poly-dispersity. Different solvents, which were used to determine the intrinsic viscosities and the viscometric consts., a and K (published in the literature for pullulan), were compared. The various parameters affecting the consts. are discussed. The procedure to determine the correct value of the hydrodynamic volume for pullulan was also described. This study resulted in the following MHS equations for narrow and broad MWD series of pullulan samples with Mw in the range of 5-1000 kDa: [η] = 1.990 + 10-4Mv0.667 = 1.990 + 10-4qMHSMw0.667 = 1.956 + 10-4Mw0.667 (Narrow MWD) [η] = 2.263 + 10-4Mv0.657 = 2.263 + 10-4qMHSMw0.657 = 2.056 + 10-4Mw0.657 (Broad MWD) where qMHS is the polydispersity correction factor and [η] is the intrinsic viscosity in dL g-1. The plot of log K vs. exponent a was linear and inversely related. This curve was used to estimate the constant K for pullulan with a known exponent a. Among various reported solvents, the diluted aqueous salt solns. have more advantages than other solvents.
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 2 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:1092887 CAPLUS
DOCUMENT NUMBER: 144:369058
TITLE: Influence of supplemental high molecular weight pullulan or γ-cyclodextrin on ileal and total tract nutrient digestibility, fecal characteristics, and microbial populations in the dog
AUTHOR(S): Spears, Julie K.; Karr-Lilienthal, Lisa K.; Fahey, George C., Jr
CORPORATE SOURCE: Department of Animal Sciences, University of Illinois, Urbana, USA
SOURCE: Archives of Animal Nutrition (2005), 59(4), 257-270
CODEN: AANUET; ISSN: 1745-039X
PUBLISHER: Taylor & Francis Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB This study was conducted to determine if supplemental pullulan and γ-cyclodextrin affect canine nutrient digestibility, microbial populations, and fecal characteristics. Ileal cannulated dogs were fed a com. diet, and treatments were administered daily in a 5+5 Latin square design: (i) no supplement; (ii) 2 g pullulan; (iii) 4 g pullulan; (iv) 2 g γ-cyclodextrin; (v) 4 g γ-cyclodextrin. Ileal and fecal samples were collected the last 4 d of each 14-d period. Increasing pullulan tended ($p < 0.10$) to cause linear increases in ileal bifidobacteria and lactobacilli and quadratic increases in fecal lactobacilli. A similar response was noted in ileal bifidobacteria and

lactobacilli with γ-cyclodextrin. γ-Cyclodextrin resulted in a quadratic decrease ($p < 0.05$) in fecal Clostridium perfringens. Increasing pullulan linearly increased ($p < 0.05$) fecal score, while γ-cyclodextrin resulted in a linear decrease ($p < 0.05$). Pullulan and γ-cyclodextrin supplementation may have beneficial effects on the microbial ecol. of dogs.

REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 3 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:626280 CAPLUS
DOCUMENT NUMBER: 141:378898
TITLE: Production of high molecular weight pullulan by Aureobasidium pullulans HP-2001 with soybean pomace as a nitrogen source
AUTHOR(S): Seo, Hyung-Pil; Son, Chang-Woo; Chung, Chung-Han; Jung, Dae-Il; Kim, Sung-Koo; Gross, Richard A.; Kaplan, David L.; Lee, Jin-Woo
CORPORATE SOURCE: Division of Biotechnology, College of Natural Resources and Life Science, Dong-A University, Pusan, 604-714, S. Korea
SOURCE: Bioresource Technology (2004), 95(3), 293-299
CODEN: BIRTEB; ISSN: 0960-8524
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The production of pullulan by Aureobasidium pullulans HP-2001 was enhanced by yeast extract as a nitrogen source as well as soybean pomace. The highest production of pullulan by A. pullulans HP-2001 with yeast extract was 5.5 g/l whereas that of pullulan with soybean pomace was 7.5 g/l. The gas chromatogram of pullulan produced by A. pullulans HP-2001 with soybean pomace as a nitrogen source showed that the major and minor components were glucose and mannose. The FTIR spectra of pullulans produced with yeast extract, a mixture of yeast extract and soybean pomace, and soybean pomace alone exhibited similar features. The increase in content of reducing sugars after pullulanase treatment of pullulans produced with different nitrogen sources indicated that all the pullulans had α-(1,6) glucosidic linkages of α-(1,4) linked maltotriose units. The average mol. wts. of pullulans produced with various concns. of yeast extract and soybean pomace ranged from 0.17 to 1.32 + 106 and from 1.32 to 5.66 + 106, resp. All pullulans produced by A. pullulans HP-2001 in this study had the same basic structures, but their ratios of monomeric components were a little different, which might result in the production of pullulans with different mol. wts.

REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 4 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:86678 CAPLUS
DOCUMENT NUMBER: 138:339909
TITLE: Molecular weight effects on solution rheology of pullulan and mechanical properties of its films
AUTHOR(S): Lazaridou, Athina; Biliaderis, Costas G.; Kontogiorgos, Vassilis
CORPORATE SOURCE: School of Agriculture, Laboratory of Food Chemistry and Biochemistry, Food Science and Technology Department, Aristotle University, Thessaloniki, 54006, Greece
SOURCE: Carbohydrate Polymers (2003), 52(2), 151-166
CODEN: CAPOD8; ISSN: 0144-8617
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal

LANGUAGE: English

AB The effects of mol. wt. on solution rheol. of pullulan, and on thermomech. properties of sorbitol and(or) water-plasticized pullulan specimens, prepared by either hot pressing or casting of aqueous solns., were studied. Pullulan samples differing in mol. wt. were characterized by 13C NMR spectroscopy and SEC combined with a multi-angle laser light scattering and a refractive index detector. For samples with wt. average mol. wt. (Mw) ranging between 100 and 560 + 103, the values of limiting viscosity ([η]), critical concentration (c*), and coil overlap parameter (c*[η]) were within the range 0.38-0.70 dL/g, 1.4-3.1 g/dL and 1.0-1.2 dL/g, resp. The thermomech. properties of 5 mol. wt. grades of pullulan, either alone or with sorbitol (plasticized at a 10% d.b. level) were examined by dynamic mech. thermal anal. (DMTA). A large drop in storage modulus E' (.apprx.101.5-103 Pa) and a peak in tan δ in the DMTA traces accompanied the glass-rubber transition (Tg) or the α-relaxation (Tα) of pullulan; the magnitude of the drop in E' and the tan δ peak height increased with increasing water content. The plasticizing action of water and sorbitol was evident in the DMTA curves, and the Tg vs. moisture content data were fitted to the Gordon-Taylor empirical model. Within the range of mol. wts. tested, there was no effect of polymer mol. wt. on Tg. A β-relaxation detected by DMTA was shifted to lower temperature with increasing moisture content and to higher temperature with addition of sorbitol. Apparent activation energies for α-relaxation (Eαα) and β-relaxation (Eαβ) processes, estimated from multi-frequency measurements, were within 171-640 and 118-256 kJ/mol, resp.; the values for Eαα and fragility' parameter decreased with increasing moisture content. Anal. of viscoelasticity data using the time-temperature superposition principle with the Williams-Landel-Ferry equation was successful over the range Tg to Tg + 40°, provided that the coeffs. C1 and C2 are optimized and not allowed to assume their universal' values. Large deformation mech. tests demonstrated large decreases in tensile (Young's) modulus (E) and strength (σmax), and an increase in percentage elongation with increasing water content and(or) addition of sorbitol in pullulan films. Relationships between the tensile parameters (E and σmax) and water content showed an increase in stiffness of the films from 3 to 7% moisture, and a strong softening effect at higher water contents. The tensile tests revealed some relationships between mech. properties under uniaxial load and the mol. characteristics of pullulan, e.g. E, σmax, and elongation values increased with increasing mol. wt.

REFERENCE COUNT: 89 THERE ARE 89 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 5 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:304637 CAPLUS

DOCUMENT NUMBER: 137:77959

TITLE: Effect of dissolved oxygen concentration and pH on the mass production of high molecular weight pullulan by Aureobasidium pullulans

AUTHOR(S): Lee, Ji-Hyun; Kim, Jeong-Hwa; Kim, Mi-Ryung; Lim, Sung-Mi; Nam, Soo-Wan; Lee, Jin-Woo; Kim, Sung-Koo

CORPORATE SOURCE: Division of Food and Biotechnology, Pukyong National University, Pusan, 608-737, S. Korea

SOURCE: Journal of Microbiology and Biotechnology (2002), 12(1), 1-7
CODEN: JOMBES; ISSN: 1017-7825

PUBLISHER: Korean Society for Microbiology and Biotechnology

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The effects of DO and pH on the mass production of pullulan with high mol.

wt. and the morphol. of A. pullulans ATCC 42023 were evaluated. A. pullulans showed a maximum production of pullulan (11.98 g/l) when the initial pH of the culture broth was 6.5 in a shake-flask culture. In a batch culture, the mixture of a yeast-like and mycelial cell forms was found at a pH of 4.5, and the maximum production of pullulan (13.31 g/l) was obtained. However, a high proportion of high mol. wt. pullulan (M.W.>2,000,000) was produced at a pH of 6.5, with a yeast-like morphol. The maximum pullulan production yield (51%) was obtained at a pH noncontrol (initial pH 6.5) and DO control (above 50%) condition. Pullulan degrading enzyme was activated when the pH of the broth was lower than 5.0 and the portion of low mol. wt. pullulan was increased. The formation of a black pigment was observed at an initial stationary phase, at 40 h of fermentation Therefore, the fermentation should be carried out in a pH noncontrol (initial pH of 6.5) and DO control (above 50%) condition, and should be harvested before reaching the stationary phase (around 40 h) for the production of high mol. wt. pullulan.

REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 6 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:250219 CAPLUS
DOCUMENT NUMBER: 137:5070
TITLE: Optimization of high molecular weight pullulan production by Aureobasidium pullulans in batch fermentations
AUTHOR(S): Gibson, Larry H.; Coughlin, Robert W.
CORPORATE SOURCE: Department of Chemical Engineering, University of Connecticut, Storrs, CT, 06269, USA
SOURCE: Biotechnology Progress (2002), 18(3), 675-678
CODEN: BIPRET; ISSN: 8756-7938
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Of 5 strains of A. pullulans studied, NRRL Y-2311-1 yielded the highest titer (26.2 g/L) of pullulan and formed the lowest amount of melanin-like pigment. Sucrose was superior to glucose as the C and energy source on the basis of yield and titer of pullulan produced. Pullulan titer was higher (26.2 vs 5.1 g/L), biomass concentration was lower (6.9 vs 12.7 g/L), and DO was lower (0 vs 60% of saturation) when the fermenter was agitated by a marine propeller compared to Rushton impellers. Pullulan produced by strain NRRL Y-2311-1 ranged in wt.-average molar mass (Mw) from 486 KDa and number-average molar mass (Mn) from 220 Da on day 1 of growth to 390 KDa and 690 Da on day 6; Mw declined by about 35% from day 1 to day 3, the day of maximum pullulan titer. For the other strains, the ranges of molar mass on the day of maximum pullulan titer were 338-614 KDa (Mw) and 100-6820 Da (Mn).

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 7 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:794293 CAPLUS
DOCUMENT NUMBER: 136:324243
TITLE: Pullulan as molecular weight standard for gelatin
AUTHOR(S): Tani, Sadako
CORPORATE SOURCE: Nippi Co. Ltd., 1 Yumizawa-cho Fujinomiya-shi Sizuoka, 418-0073, Japan
SOURCE: Nippon Shashin Gakkaishi (2001), 64(4), 264-266
CODEN: NSGKAP; ISSN: 0369-5662
PUBLISHER: Nippon Shashin Gakkai

DOCUMENT TYPE: Journal
LANGUAGE: Japanese
AB The applicability of a polysaccharide, pullulan, as a mol. wt. standard for a gel permeation chromatogram of gelatin was investigated. It was confirmed that pullulan has a weak UV absorber that is detectable with a conventional UV detector at 230 nm, whereas a differential refractometer is generally used for the detection. The relationship between mol. wt. and retention time for standard pullulan samples was obtained. The retention time of α, β and γ chains of gelatin lied on the curve reasonably. Pullulan is suitable as the mol. wt. standard for gel permeation chromatog. anal. of gelatin with the conventional setup.

L20 ANSWER 8 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:505875 CAPLUS
DOCUMENT NUMBER: 135:225912
TITLE: Optimization of conditions for the production of pullulan and high molecular weight pullulan by Aureobasidium pullulans
AUTHOR(S): Lee, Ji-Hyun; Kim, Jeong-Hwa; Zhu, Il-Hui; Zhan, Xiao-Bei; Lee, Jin-Woo; Shin, Dong-Hoon; Kim, Sung-Koo
CORPORATE SOURCE: Division of Food and Biotechnology, Pukyung National University, Pusan, 608-737, S. Korea
SOURCE: Biotechnology Letters (2001), 23(10), 817-820
CODEN: BILED3; ISSN: 0141-5492
PUBLISHER: Kluwer Academic Publishers
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Aureobasidium pullulans had a maximum yield coefficient of pullulan (Yp/s = 0.24) with an initial pH of the culture broth of 6.5 in a shake-flask culture. In a batch culture, the maximum pullulan yield coefficient of 0.30 was obtained at the aeration rate of 0.5 vvm. A yeast-like form and mycelial form of cells were found at the culture broth with pH controlled at 4.5 with a maximum yield coefficient of pullulan of 0.27. However, a high portion (35%) of high mol. wt. pullulan (Mw > 2 000 000) was produced at pH 6.5 with a yeast-like morphol. of the cells.
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 9 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:552710 CAPLUS
DOCUMENT NUMBER: 133:236898
TITLE: Production of high molecular weight pullulan by Aureobasidium pullulans using glucosamine
AUTHOR(S): Kim, Jeong-Hwa; Kim, Mi-Ryung; Lee, Ji-Hyun; Lee, Jin-Woo; Kim, Sung-Koo
CORPORATE SOURCE: Division of Food and Biotechnology, Pukyung National University, Pusan, 608-737, S. Korea
SOURCE: Biotechnology Letters (2000), 22(12), 987-990
CODEN: BILED3; ISSN: 0141-5492
PUBLISHER: Kluwer Academic Publishers
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Pullulan productivity was optimized in Aureobasidium pullulans ATCC 42023 with 54 g glucose l-1. Pullulan with its higher mol. wt. (>1 000 000) was produced using 2% (w/v) glucose and 3% (w/v) glucosamine together. The maximum concentration of pullulan was 8 g l-1 at 140 h with shake-flask culture.
REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 10 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:153395 CAPLUS
DOCUMENT NUMBER: 132:209375
TITLE: Size-exclusion chromatography study of the molecular-weight distribution of γ-irradiated pullulan
AUTHOR(S): Shingel, K. I.; Tsarenkov, V. M.; Petrov, P. T.
CORPORATE SOURCE: Scientific Pharmaceutical Centre, Belmedpreparaty Pharmaceutical Co., Minsk, Belarus
SOURCE: Carbohydrate Research (2000), 324(4), 283-287
CODEN: CRBRAT; ISSN: 0008-6215
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The polyelectrolyte behavior of γ-irradiated pullulan (I) in aqueous solns. leads to secondary effects of adsorption on a Shodex OHPak KB 806 column gel during size-exclusion chromatog. Suppression of the polyelectrolyte properties of γ-irradiated I is achieved by using a 0.05 M aqueous solution of NaH2PO4 (pH 4.95) as the mobile phase. Under these conditions, adequate mol.-wt. distributions of γ-irradiated I samples are obtained.
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 11 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1996:210585 CAPLUS
DOCUMENT NUMBER: 124:258614
TITLE: Influence of culture pH and aeration on ethanol production and pullulan molecular weight by Aureobasidium pullulans
AUTHOR(S): Madei, Nuri S.; McNeil, Brian; Harvey, Linda M.
CORPORATE SOURCE: Dep. Bioscience and Biotechnology, Univ. Strathclyde, Glasgow, G1 1XW, UK
SOURCE: Journal of Chemical Technology & Biotechnology (1996), 65(4), 343-50
CODEN: JCTBED; ISSN: 0268-2575
PUBLISHER: Wiley
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The formation of ethanol by the polymorphic fungus Aureobasidium pullulans was examined under a range of culture pH values and aeration conditions. Although culture pH had a profound effect on fungal morphol., with a greatly increased proportion of the biomass in the unicellular (yeast-like) form at pH 6.5, there appeared to be no direct link between morphol. form and ethanol formation. The levels of ethanol noted may have influenced the morphol. Cessation of aeration rapidly led to a halt in growth and exopolysaccharide synthesis, while ethanol synthesis proceeded rapidly. The ethanol formed could be re-oxidized under conditions in which the available carbon source was depleted. Two distinct exopolysaccharides of different mol. wts. were recovered from the culture fluids. Overall, the mol. wt. of both declined with process time.

L20 ANSWER 12 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:506685 CAPLUS
DOCUMENT NUMBER: 121:106685
TITLE: Manufacture of high-molecular weight pullulan and prevention of blackening of culture media
INVENTOR(S): Nagura, Shigehiro; Maruyama, Kazumasa
PATENT ASSIGNEE(S): Shinetsu Chemical Industry Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05328988	A2	19931214	JP 1992-163537	19920529
JP 3078401	B2	20000821		

PRIORITY APPLN. INFO.: JP 1992-163537 19920529

AB High-mol. wt. pullulan is manufactured without blackening of culture media by culture of Aureobasidium pullulans and heating of the culture solns. at 50-75° for 0.3-3 h. A. pullulans ATCC 74105 was cultured in a medium containing sucrose and salts for 2 days and resulting 20 g/L pullulan-containing culture solution was heated at 55-60° for 30 min to give a milk white solution, from which pullulan of 6.4 + 106 mol. wt. was isolated.

L20 ANSWER 13 OF 28 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:132237 CAPLUS
DOCUMENT NUMBER: 120:132237
TITLE: Suppression of murine IgE responses with ovalbumin-pullulan conjugates: Comparison of the suppressive effect of different conjugation methods and different molecular weights of pullulan
AUTHOR(S): Uchida, Tetsuya; Ikegami, Hakuo; Ando, Shunsaku; Kurimoto, Masashi; Mitsuhashi, Masakazu; Naito, Seishiro; Usui, Mitsuko; Matuhasi, Tyoku
CORPORATE SOURCE: Dep. Saf. Res. Biol., Natl. Inst. Health, Tokyo, Japan
SOURCE: International Archives of Allergy and Immunology (1993), 102(3), 276-8
CODEN: IAAIEG; ISSN: 1018-2438
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Ovalbumin(OVA)-pullulan conjugates were made using four different conjugation methods and eight different mol. wts. of pullulan ranging from 4,200 to 600,000. Pretreatment of mice by the administration of conjugates made by using cyanuric chloride or cyanogen bromide and pullulan of mol. wt. 40,000 or more, anti-OVA IgE antibody response was suppressed completely and anti-OVA IgM and IgG antibody response was enhanced. In contrast, by the administration of conjugates made by using an oxidation or thiol activation method, only partial suppression of anti-OVA IgE antibody response was achieved and no enhancement of anti-OVA IgM and IgG antibody production was observed

L1 ANSWER 1 OF 9 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2006:448935 CAPLUS
DOCUMENT NUMBER: 145:103893
TITLE: Intrinsic viscosity-molecular weight relationship and hydrodynamic volume for pullulan
AUTHOR(S): Kasaai, Mohammad R.
CORPORATE SOURCE: Faculty of Agriculture, Mazandaran University, Sari, Iran
SOURCE: Journal of Applied Polymer Science (2006), 100(6), 4325-4332
CODEN: JAPNAB; ISSN: 0021-8995
PUBLISHER: John Wiley & Sons, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A numerical method for determination of Mark-Houwink-Sakurada (MHS) equation consts., a and K, was tested with success for two series of pullulan standard samples having narrow and broad mol. wt. distributions (MWD) and taken into account their poly-dispersity. Different solvents, which were used to determine the intrinsic viscosities and the viscometric consts., a and K (published in the literature for pullulan), were compared. The various parameters affecting the consts. are discussed. The procedure to determine the correct value of the hydrodynamic volume for pullulan was also described. This study resulted in the following MHS equations for narrow and broad MWD series of pullulan samples with Mw in the range of 5-1000 kDa: [η] = 1.990 + 10-4Mv0.667 = 1.990 + 10-4qMHSMw0.667 = 1.956 + 10-4Mw0.667 (Narrow MWD) [η] = 2.263 + 10-4Mv0.657 = 2.263 + 10-4qMHSMw0.657 = 2.056 + 10-4Mw0.657 (Broad MWD) where qMHS is the polydispersity correction factor and [η] is the intrinsic viscosity in dL g-1. The plot of log K vs. exponent a was linear and inversely related. This curve was used to estimate the constant K for pullulan with a known exponent a. Among various reported solvents, the diluted aqueous salt solns. have more advantages than other solvents.
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 2 OF 9 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:241716 CAPLUS
DOCUMENT NUMBER: 142:463043
TITLE: Size and shape of soil humic acids estimated by viscosity and molecular weight
AUTHOR(S): Kawahigashi, Masayuki; Sumida, Hiroaki; Yamamoto, Kazuhiko
CORPORATE SOURCE: College of Bioresource Science, Nihon University, Fujisawa, Kanagawa, 252-8510, Japan
SOURCE: Journal of Colloid and Interface Science (2005), 284(2), 463-469
CODEN: JCISA5; ISSN: 0021-9797
PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Ultrafiltration fractions of three soil humic acids were characterized by viscometry and high-performance size-exclusion chromatog. (HPSEC) in order to estimate shapes and hydrodynamic sizes. Intrinsic viscosities under given solute/solvent/temperature conditions were obtained by extrapolating the concentration dependence of reduced viscosities to zero concentration Mol. mass (wt. average mol. wt. (Mw) and number average mol. wt. (Mn)) and hydrodynamic radius (RH) were determined by HPSEC using pullulan as calibrant. Values of Mw and Mn ranged from 15 to 118 + 103 and from 9 to 50 + 103 (g mol-1), resp. Polydispersity, as indicated by Mw/Mn, increased with

increasing filter size from 1.5 to 2.4. The hydrodynamic radii (RH) ranged between 2.2 and 6.4 nm. For each humic acid, Mw and [η] were related. Mark-Houwink coeffs. calculated on the basis of the Mw-[η] relationships suggested restricted flexible chains for two of the humic acids and a branched structure for the third humic acid. Those structures probably behave as hydrated sphere colloids in a good solvent. Hydrodynamic radii of fractions calculated from [η] using Einstein's equation, which is applicable to hydrated sphere colloids, ranged from 2.2 to 7.1 nm. These dimensions are fit to the size of nanospaces on and between clay minerals and micropores in soil particle aggregates. On the other hand, the good agreement of RH values obtained by applying Einstein's equation with those directly determined by HPSEC suggests that pullulan is a suitable calibrant for estimation of mol. mass and size of humic acids by HPSEC.

REFERENCE COUNT: 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 3 OF 9 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:756864 CAPLUS
DOCUMENT NUMBER: 141:238821
TITLE: Pullulan degrading enzyme of Aureobasidium pullulans hydrolyzing α-1,4-glucosidic bond and use for producing pullulan with low viscosity
INVENTOR(S): Mukai, Kazuhisa; Kubota, Michio; Fukuda, Shigeharu; Miyake, Toshio
PATENT ASSIGNEE(S): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Japan
SOURCE: PCT Int. Appl., 35 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004078959	A1	20040916	WO 2004-JP2567	20040302
W: AE, AE, AG, AL, AL, AM, AM, AM, AT, AT, AU, AZ, AZ, BA, BB, BG, BG, BR, BR, BW, BY, BY, BZ, BZ, CA, CH, CN, CN, CO, CO, CR, CR, CU, CU, CZ, CZ, DE, DE, DK, DK, DM, DZ, EC, EC, EE, EE, EG, ES, ES, FI, FI, GB, GD, GE, GE, GH, GM, HR, HR, HU, HU, ID, IL, IN, IS, KE, KE, KG, KG, KP, KP, KP, KR, KR, KZ, KZ, KZ, LC, LK, LR, LS, LS, LT, LU, LV, MA, MD, MD, MG, MK, MN, MW, MX, MX, MZ, MZ, NA, NI, NI, NO				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
JP 2004261132	A2	20040924	JP 2003-56474	20030304

PRIORITY APPLN. INFO.: JP 2003-56474 A 20030304

AB A novel pullulan degrading enzyme; use for its production using a microorganism of Aureobasidium Genus; use for degrading pullulan ; and use for producing pullulan with low viscosity and/or its polydispersity index (Mw/Mn ratio). The novel pullulan degrading enzyme can be used for production a pullulan which has a low viscosity and a small wt. average mol. wt./number average mol. wt. ratio and is easy to handle. A novel pullulan degrading enzyme was isolated from Aureobasidium pullulans using hydrophobic chromatog., and anion exchange chromatog. The enzyme showed activity toward 63-O-α-glucosylmaltotriose, 64-O-α-glucosylmaltotetraose, 65-O-α-glucosylmaltopentaose, 63-O-α-maltotriosylmaltotriose, 63-O-α-(63-O-α-maltotriosylmaltotriosyl)-maltotriose, and

pullulan, hydrolyzing α-1,4-glucosidic bond at the reducing end next to the α-1,6-glucosidic bond. Its activity was inhibited by 1 mM Hg2+, Pb2+, and Fe3+.

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 4 OF 9 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:721195 CAPLUS
DOCUMENT NUMBER: 140:41137
TITLE: Preparation and characterization of molecular weight standards of low polydispersity from oat and barley (1 → 3)(1 → 4)-β-D-glucan
AUTHOR(S): Wang, Q.; Wood, P. J.; Huang, X.; Cui, W.
CORPORATE SOURCE: Food Research Program, Agriculture and Agri-Food Canada, Guelph, ON, N1G 5C9, Can.
SOURCE: Food Hydrocolloids (2003), 17(6), 845-853
CODEN: FOHYES; ISSN: 0268-005X
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Purified (1→3)(1→4)-β-D-glucans (β-glucans) from oat and barley with broad mol. wt. (MW) distribution were separated into seven fractions using gradient precipitation with ammonium sulfate (NH4)2SO4. The MW of each fraction decreased consecutively with the concentration of (NH4)2SO4 at which it was precipitated The MW distribution of each fraction was much narrower compared to the parent sample and is comparable to com. available pullulan MW stds. To determine whether the fractionation process was separating sub-fractions of different structure, the original β-glucan sample and each fraction were hydrolyzed by a (1→3)(1→4)-D-β-glucan-4-glucanohydrolase (lichenase, E.C.3.2.1.73) and the liberated oligosaccharides were analyzed by high performance anion exchange chromatog. The anal. revealed no differences in oligosaccharide pattern (DP 2-9) derived from each fraction and the parent sample. In particular, the tri/tetra oligosaccharide ratio remained constant for all fractions, indicating no fractionation based on structural features had taken place. The effect of starting β-glucan concentration on the fractionation process was studied. The results showed that it was possible to achieve good separation at overlapping parameter c[η] lower than .apprx.3.5. Further increase in starting β-glucan concentration hindered clear separation of the fractions. Temperature also affected the fractionation efficiency. The higher the temperature, the lower the amount of (NH4)2SO4 that was necessary to precipitate the samples of same MW. A Mark Houwink relationship was derived from the measured MW and intrinsic viscosity for fractions from oat and barley, resp.

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 5 OF 9 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:86678 CAPLUS
DOCUMENT NUMBER: 138:339909
TITLE: Molecular weight effects on solution rheology of pullulan and mechanical properties of its films
AUTHOR(S): Lazaridou, Athina; Biliaderis, Costas G.; Kontogiorgos, Vassilis
CORPORATE SOURCE: School of Agriculture, Laboratory of Food Chemistry and Biochemistry, Food Science and Technology Department, Aristotle University, Thessaloniki, 54006, Greece
SOURCE: Carbohydrate Polymers (2003), 52(2), 151-166
CODEN: CAPOD8; ISSN: 0144-8617

PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The effects of mol. wt. on solution rheol. of pullulan, and on thermomech. properties of sorbitol and(or) water-plasticized pullulan specimens, prepared by either hot pressing or casting of aqueous solns., were studied. Pullulan samples differing in mol. wt. were characterized by 13C NMR spectroscopy and SEC combined with a multi-angle laser light scattering and a refractive index detector. For samples with wt. average mol. wt. (Mw) ranging between 100 and 560 + 103, the values of limiting viscosity ([η]), critical concentration (c*), and coil overlap parameter (c*[η]) were within the range 0.38-0.70 dL/g, 1.4-3.1 g/dL and 1.0-1.2 dL/g, resp. The thermomech. properties of 5 mol. wt. grades of pullulan, either alone or with sorbitol (plasticized at a 10% d.b. level) were examined by dynamic mech. thermal anal. (DMTA). A large drop in storage modulus E' (.apprx.101.5-103 Pa) and a peak in tan δ in the DMTA traces accompanied the glass-rubber transition (Tg) or the α-relaxation (Tα) of pullulan; the magnitude of the drop in E' and the tan δ peak height increased with increasing water content. The plasticizing action of water and sorbitol was evident in the DMTA curves, and the Tg vs. moisture content data were fitted to the Gordon-Taylor empirical model. Within the range of mol. wts. tested, there was no effect of polymer mol. wt. on Tg. A β-relaxation detected by DMTA was shifted to lower temperature with increasing moisture content and to higher temperature with addition of sorbitol.

Apparent activation energies for α-relaxation (Eαα) and β-relaxation (Eαβ) processes, estimated from multi-frequency measurements, were within 171-640 and 118-256 kJ/mol, resp.; the values for Eαα and fragility' parameter decreased with increasing moisture content. Anal. of viscoelasticity data using the time-temperature superposition principle with the Williams-Landel-Ferry equation was successful over the range Tg to Tg + 40°, provided that the coeffs. C1 and C2 are optimized and not allowed to assume their universal' values. Large deformation mech. tests demonstrated large decreases in tensile (Young's) modulus (E) and strength (σmax), and an increase in percentage elongation with increasing water content and(or) addition of sorbitol in pullulan films. Relationships between the tensile parameters (E and σmax) and water content showed an increase in stiffness of the films from 3 to 7% moisture, and a strong softening effect at higher water contents. The tensile tests revealed some relationships between mech. properties under uniaxial load and the mol. characteristics of pullulan, e.g. E, σmax, and elongation values increased with increasing mol. wt.
REFERENCE COUNT: 89 THERE ARE 89 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 6 OF 9 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1997:787986 CAPLUS
DOCUMENT NUMBER: 128:53332
TITLE: Determination of molecular-weight distribution of dextran for injection by size-exclusion chromatography and study for molecular-weight standards
AUTHOR(S): Yomota, Chikako; Okada, Satoshi
CORPORATE SOURCE: Osaka Branch, Natl. Inst. Health Sci., Osaka, 540, Japan
SOURCE: Bunseki Kagaku (1997), 46(12), 979-985
CODEN: BNSKAK; ISSN: 0525-1931
PUBLISHER: Nippon Bunseki Kagakkai
DOCUMENT TYPE: Journal
LANGUAGE: Japanese
AB It is well known that dextran for clin. use should have narrow mol.-wt. (Mw) distributions, because any material with a

Mw that is too small is rapidly lost from circulation, and is therefore therapeutically ineffective; also, any material with a Mw that is too high can interfere with the normal coagulation process of the blood. Therefore, accurate and rapid methods are necessary for measuring the Mw distribution of dextran. In this study, the mol. wt. of dextran for injection and dextran prepns. were estimated by a method adopted in the European Pharmacopoeia (EP) using the polydisperse standard of dextran and also by the usual method using the pullulan stds. From the results, it has been clarified that pullulan is a useful standard for the injection of dextran, such as dextran 70 and dextran 40. It was also found that the mol. wts. of almost all clin. dextran in Japan seem to be smaller than the specifications described in EP, whereas their limiting viscosities are in the range of the specifications in the Japanese Pharmacopoeia.

L1 ANSWER 7 OF 9 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1988:142518 CAPLUS
DOCUMENT NUMBER: 108:142518
TITLE: Studies of hydrodynamic chromatography of polymers. IV. Capillary hydrodynamic chromatography of polysaccharides, schizophyllan, and xanthan
AUTHOR(S): Tazaki, Michiko; Maruyama, Iwao; Takase, Satoru; Homma, Terutaka
CORPORATE SOURCE: Dep. Chem. Process Eng., Ikutoku Tech. Univ., Atsugi, 243-02, Japan
SOURCE: Kobunshi Ronbunshu (1988), 45(1), 19-23
CODEN: KBRBA3; ISSN: 0386-2186
DOCUMENT TYPE: Journal
LANGUAGE: Japanese
AB Capillary hydrodynamic chromatog. (c-HDC) of schizophyllan (Sz, unfractionated, .hivin.Mw ≈ 250 + 104) and xanthan (xa, unfractionated, -Mw ≈ 220 + 104) is reported. Pullulan samples (84.6 + 104 and 43.5 + 104) were chromatographed as a reference material. No peak separation from low marker mols. was obtained for the samples. From chromatog. peaks, the effective diams. Rhe of Sz and Xa mols. in solution were obtained using polystyrene latex calibration. Intrinsic viscosity and mol. wt. data for these polysaccharides gave hydrodynamic vols. and resulting diams. of the mols. Rh in solution by the Flory-Fox equation. For Sz and Xa, Rhe values of 250-500 nm were obtained. Also the relation Rw .simeq. Rh was noted. For Xa, fractions having Rhe > 1000 nm were sometimes observed Chromatog. separation of such bigger fractions is one advantageous point in using c-HDC.

L1 ANSWER 8 OF 9 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1987:423618 CAPLUS
DOCUMENT NUMBER: 107:23618
TITLE: Temperature and molecular weight dependence of the unperturbed dimensions of aqueous pullulan
AUTHOR(S): Buliga, Gregory S.; Brant, David A.
CORPORATE SOURCE: Dep. Chem., Univ. California, Irvine, CA, 92717, USA
SOURCE: International Journal of Biological Macromolecules (1987), 9(2), 71-6
CODEN: IJBMDR; ISSN: 0141-8130
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The intrinsic viscosities, [η], and light scattering mol. wts., Mw, second virial coeffs., A'2, and root-mean-square radii of gyration, (Sz2)1/2, were measured for a series of pullulan fractions in aqueous solution at 25°. These were used to establish the dependence on mol. wt. of [η], A'2, and (Sz2)1/2 and to deduce the limiting characteristic ratio of the unperturbed mean-square end-to-end distance C∞ (4.3) for aqueous pullulan at this

temperature The temperature dependence of C∞ was determined from measurements of the
same properties for selected fractions at a series of temps., and the temperature coefficient dln C∞/dT (-0.0043 deg-1) was established.

L1 ANSWER 9 OF 9 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1983:90210 CAPLUS
DOCUMENT NUMBER: 98:90210
TITLE: Comparison of poly(ethylene oxide), pullulan and dextran as polymer standards in aqueous gel chromatography
AUTHOR(S): Kato, Tadaya; Tokuya, Tadashi; Takahashi, Akira
CORPORATE SOURCE: Fac. Eng., Mie Univ., Tsu, 514, Japan
SOURCE: Journal of Chromatography (1983), 256(1), 61-9
CODEN: JOCRAM; ISSN: 0021-9673
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Aqueous gel chromatog. for poly(ethylene oxide)(I) [25322-68-3], pullulan (II) [9057-02-7], and dextran [9004-54-0] were performed in 0.1 M aqueous NaCl at 25° using a crosslinked hydrophilic vinyl polymer gel. Calibration curves, log Mw vs. Vr,w, for I and II were linear over a wide mol wt. range, where Mw denotes the wt.-average mol. wt. and Vr,w the retention volume at the center of mass of the chromatogram peak. However, the corresponding calibration curve for dextran was nonlinear. Evidence in support of a universal calibration procedure was obtained for the three polymers since a single straight line could be drawn through the data points for all three polymers plotted on the same graphs for z-average square radius of gyration vs. Vr,w and for log [η] Mw vs. Vr,w, where [η] denotes intrinsic viscosity. The data indicated that either I or II was suitable as a polymer standard in aqueous gel chromatog., with I being the better.

L8 ANSWER 1 OF 3 MEDLINE on STN
ACCESSION NUMBER: 2006537684 IN-PROCESS
DOCUMENT NUMBER: PubMed ID: 16891068
TITLE: Adriamycin release from self-assembling nanospheres of poly(DL-lactide-co-glycolide)-grafted pullulan.
AUTHOR: Jeong Young-Il; Na Hee-Sam; Oh Jong-Suk; Choi Ki-Choon; Song Chae-Eun; Lee Hyun-Chul
CORPORATE SOURCE: Department of Microbiology, Chonnam National University Medical School, 5, Hak-1-dong, Dong-Gu, Gwang-ju 501-746, Republic of Korea.
SOURCE: International journal of pharmaceutics, (2006 Sep 28) Vol. 322, No. 1-2, pp. 154-60. Electronic Publication: 2006-05-16.
Journal code: 7804127. ISSN: 0378-5173.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: NONMEDLINE; IN-PROCESS; NONINDEXED; Priority Journals
ENTRY DATE: Entered STN: 12 Sep 2006
Last Updated on STN: 18 Oct 2006

AB Poly(DL-lactide-co-glycolide)-graft pullulan (PuLG) was synthesized to produce a hydrophobically modified polysaccharide. Specific pullulan and poly(DL-lactide-co-glycolide) (PLGA) (abbreviated as PuLG) appeared in the peaks of the PuLG spectra on (1)H NMR spectroscopy, suggesting that PLGA was successively grafted to the pullulan backbone. PuLG nanospheres have a round shape with a particle size of about 75-150 nm. From the fluorescence excitation spectra in a fluorescence probe study, the critical association concentration (CAC) values were determined to be 0.017 g/l for PuLG-1, 0.0054 g/l for PuLG-2, and 0.0047 g/l for PuLG-3. The drug contents of the PuLG nanospheres were approximately 20-30% (w/w). As the drug contents of PuLG nanospheres increased, the drug release rate from nanospheres decreased. The drug release rate from PuLG nanospheres was delayed as the molecular weight of PuLG increased. PuLG copolymer with higher graft ratio of PLGA showed slower degradation rate rather than that with lower graft ratio. Since degradation rate of PuLG was taken over 1 month, drug release was governed by diffusion mechanism rather than degradation mechanism.

L8 ANSWER 2 OF 3 MEDLINE on STN
ACCESSION NUMBER: 2000454841 MEDLINE
DOCUMENT NUMBER: PubMed ID: 10918141
TITLE: Use of holographic laser interferometry to study the diffusion of polymers in gels.
AUTHOR: Roger P; Mattisson C; Axelsson A; Zacchi G
CORPORATE SOURCE: Institut National de la Recherche Agronomique, Rue de la Geraudiere, BP 71627, 44316 Nantes Cedex 03, France.
SOURCE: Biotechnology and bioengineering, (2000 Sep 20) Vol. 69, No. 6, pp. 654-63.
Journal code: 7502021. ISSN: 0006-3592.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200009
ENTRY DATE: Entered STN: 5 Oct 2000
Last Updated on STN: 5 Oct 2000
Entered Medline: 26 Sep 2000

AB The aim of this study was to demonstrate the potential for holographic interferometry to be used for diffusion studies of large molecules in gels. The diffusion and partitioning of BSA (67,000 g/mol) and pullulans (5,900-112,000 g/mol) in agarose gel were investigated. The gel diffusion coefficients obtained for BSA were higher when distilled water was used as

a solvent compared to those obtained with 0.1 M NaCl as the solvent. Furthermore, the gel diffusion coefficient increased with increasing BSA concentration. The same trend was found for liquid BSA diffusion coefficients obtained by DLS. BSA partition coefficients obtained at different agarose gel concentrations (2-6%, w/w) decreased slightly with increasing gel concentration. However, all BSA gel diffusion coefficients measured were significantly lower than those in pure solvent and they decreased with increasing agarose concentration. The gel diffusion coefficients obtained for pullulans decreased with increasing pullulan molecular weight. The same effect from increased molecular weight was seen in the liquid diffusion coefficients measured by DLS. The pullulan partition coefficients obtained decreased with increasing molecular weight. However, pullulans with a larger Stokes' radius than BSA had partition coefficients that were higher or approximately the same as BSA. This implied that the pullulan molecules were more flexible than the BSA molecules. The results obtained for BSA in this study agreed well with other experimental studies. In addition, the magnitude of the relative standard deviation was acceptable and in the same range as for many other methods. The results thereby obtained showed that holographic interferometry is a suitable method for studying diffusion of macromolecules in gels.
 Biotechnol Bioeng 69: 654-663, 2000.

L8 ANSWER 3 OF 3 MEDLINE on STN
ACCESSION NUMBER: 2000239804 MEDLINE
DOCUMENT NUMBER: PubMed ID: 10775342
TITLE: Rotational and translational mobility of small molecules in sucrose plus polysaccharide solutions.
AUTHOR: Contreras-Lopez E; Champion D; Hervet H; Blond G; Le Meste M
CORPORATE SOURCE: Laboratoire d'Ingenierie Moleculaire et Sensorielle de l'Aliment, ENS.BANA, 1 Esplanade Erasme, 21000 Dijon, France.. elopez@u-bourgogne.fr
SOURCE: Journal of agricultural and food chemistry, (2000 Apr) Vol. 48, No. 4, pp. 1009-15.
Journal code: 0374755. ISSN: 0021-8561.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200006
ENTRY DATE: Entered STN: 29 Jun 2000
Last Updated on STN: 29 Jun 2000
Entered Medline: 19 Jun 2000

AB The effect of different polysaccharides on the rotational (D(rot)) and translational diffusion (D(trans)) coefficients of small molecules in concentrated systems (sucrose solutions) was investigated. Dextran (1 or 10% w/w) with different molecular masses (from 10(4) to 2 x 10(6) Da), gum arabic, or pullulan was added to solutions of sucrose (57.5% w/w). Viscosity measurements of the diffusion medium studied (sucrose and sucrose plus polysaccharide) were made using a Rheometric Scientific viscometer in a temperature range from 20 to -10 degrees C. The rotational mobility of nitroxide radicals (Tempol) dispersed in the concentrated systems was measured by electron spin resonance. The translational diffusion coefficient of fluorescein was determined by the fluorescence recovery after photobleaching method. The studied temperature range for the latter two techniques was from 20 to -16 degrees C. For these conditions of concentration and temperature, there was no ice formation in the samples. No effect of the molecular mass of dextran on D(rot) and D(trans) was observed when solutions with the same dry matter content were compared. Only pullulan and gum arabic, at 10%, had a significant effect on D(trans)( )()of fluorescein. Temperature and total dry matter content were observed to be

the most important factors controlling D(rot) and D(trans) in these concentrated systems.

L11 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2006:90962 CAPLUS
DOCUMENT NUMBER: 144:190955
TITLE: DWS Microrheology of a Linear Polysaccharide
AUTHOR(S): Hemar, Y.; Pinder, D. N.
CORPORATE SOURCE: Institute of Food Nutrition and Human Health and Institute of Fundamental Sciences, Massey University, Palmerston North, N. Z.
SOURCE: Biomacromolecules (2006), 7(3), 674-676
CODEN: BOMAF6; ISSN: 1525-7797
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Diffusing wave spectroscopy was used to measure the rheol. behavior of pullulan (Mw = 1 + 105) aqueous solns. up to concentration of 40 g/dL. It was found that these solns. were mainly viscous, with the loss modulus G'' higher than the elastic modulus G'. The plot of the specific viscosity ηsp as a function of pullulan concentration showed 2 critical concns. c* = 4 g/dL and c** = 15 g/dL. For c < c*, η sp ≈ c1.25±0.05; for c* < c < c**, η sp ≈ c2±0.05; and for c > c**, η sp ≈ c4.5±0.5. These results are in very good agreement with those reported in the literature.
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:99176 CAPLUS
DOCUMENT NUMBER: 138:304788
TITLE: Molecular mass distribution of polycations and dextrans by high-performance size exclusion chromatography
AUTHOR(S): Kumar, Neeraj; Azzam, Tony; Domb, Abraham J.
CORPORATE SOURCE: Department of Medicinal Chemistry & Natural Products, School of Pharmacy, Faculty of Medicine, The Hebrew University of Jerusalem, Jerusalem, 91120, Israel
SOURCE: Polymers for Advanced Technologies (2002), 13(10-12), 1071-1077
CODEN: PADTE5; ISSN: 1042-7147
PUBLISHER: John Wiley & Sons Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A high-performance size exclusion chromatog. (HPSEC) method for mol. mass distribution (MMD) was developed for polycations. Results obtained from HPSEC using UV and RI detectors were compared with the viscosity measurements. Pullulan stds. were used for Mw calibration. It is concluded that HPSEC with a UV detector offers a sensitive and simple method that has the required accuracy. Degradation studies following this method indicate that dextrans are stable at a temperature of 55°C and at different pH solns. for up to 7 days.
REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L12 ANSWER 1 OF 2 MEDLINE on STN
ACCESSION NUMBER: 2005388131 MEDLINE
DOCUMENT NUMBER: PubMed ID: 16046721
TITLE: Pullulans and gamma-cyclodextrin affect apparent digestibility and metabolism in healthy adult ileal cannulated dogs.
AUTHOR: Spears Julie K; Karr-Lilienthal Lisa K; Grieshop Christine M; Flickinger Elizabeth A; Wolf Bryan W; Fahey George C Jr
CORPORATE SOURCE: Department of Animal Sciences, University of Illinois, Urbana, 61801, USA.
SOURCE: The Journal of nutrition, (2005 Aug) Vol. 135, No. 8, pp. 1946-52.
Journal code: 0404243. ISSN: 0022-3166.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200510
ENTRY DATE: Entered STN: 28 Jul 2005
Last Updated on STN: 7 Oct 2005
Entered Medline: 6 Oct 2005

AB Pullulan and gamma-cyclodextrin are incompletely digestible, glucose-based, nonstructural carbohydrates synthesized by microorganisms. To determine their effect when incorporated into a complete liquid diet on ileal and total tract nutrient digestibility, ileal cannulated dogs (n = 8) were used in a repeated 4 x 4 Latin-square design. Twice daily, diets were offered containing 30% (DMB) maltodextrin, high-molecular-weight (MW) pullulan (MW 100,000), low-MW pullulan (MW 6300), or gamma-cyclodextrin. Fecal and ileal samples were collected for the last 4 d of each 10-d period. Dogs consuming high-MW pullulan had lower ($P < 0.05$) dry matter, organic matter, crude protein, fat, carbohydrate ileal and total tract digestibilities, and fecal DM, and higher ($P < 0.05$) fecal output and fecal scores (indicating looser stools). To evaluate glycemic and insulinemic responses to pullulans, food-deprived dogs consumed 25 g maltodextrin, high-MW pullulan, or low-MW pullulan in a repeated 3 x 3 Latin-square design. Glucose and insulin responses were determined for 180 min. Consumption of 25 g alpha-, beta-, and gamma-cyclodextrin resulted in regurgitation within 60 min. High-MW pullulan reduced ($P < 0.05$) blood glucose concentration at 15, 30, 45, and 60 min. Compared with maltodextrin, low-MW pullulan and gamma-cyclodextrin did not alter nutrient digestibilities or fecal characteristics to any extent, and low MW pullulan did not affect glycemic response. Although high MW pullulan decreased glycemic response, consumption of large amounts negatively affected nutrient digestibility and fecal characteristics.

L12 ANSWER 2 OF 2 MEDLINE on STN
ACCESSION NUMBER: 2005002262 MEDLINE
DOCUMENT NUMBER: PubMed ID: 15627833
TITLE: Effects of advanced glycation end products on hyaluronan photolysis: a new mechanism of diabetic vitreopathy.
AUTHOR: Katsumura Chihiro; Sugiyama Tetsuya; Nakamura Kimitoshi; Obayashi Hiroshi; Hasegawa Goji; Oku Hidehiro; Ikeda Tsunehiko
CORPORATE SOURCE: Department of Ophthalmology, Osaka Medical College, Takatsuki, Osaka, Japan.
SOURCE: Ophthalmic research, (2004 Nov-Dec) Vol. 36, No. 6, pp. 327-31.
Journal code: 0267442. ISSN: 0030-3747.
PUB. COUNTRY: Switzerland

DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200502
ENTRY DATE: Entered STN: 4 Jan 2005
Last Updated on STN: 16 Feb 2005
Entered Medline: 14 Feb 2005

AB PURPOSE: To test the effects of advanced glycation end products (AGEs), which are increased in vitreous of diabetic patients, on photolysis of hyaluronan. METHODS: Pullulan standards were used as molecular weight (MW) markers to obtain a calibration curve. 0.02% hyaluronan solutions were divided into AGE-added and AGE-free samples; each sample was irradiated using a xenon lamp or kept in the dark. Retention time (RT) was measured for each sample using high-performance liquid chromatography. RESULTS: RTs and logarithm of MW of pullulan standards were negatively correlated. In hyaluronan samples exposed to light, RT increased significantly for both AGE-added and AGE-free samples compared with samples kept in the dark. RT in AGE-added samples was greater by 3% than that in AGE-free samples ($p = 0.02$). CONCLUSIONS: Exposure to light decreases MW of hyaluronan; addition of AGEs promotes this change. The photosensitizer activity of AGEs may be associated with accelerated depolymerization of hyaluronan in diabetic patients.

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L13 ANSWER 1 OF 2 MEDLINE on STN
ACCESSION NUMBER: 2005002262 MEDLINE
DOCUMENT NUMBER: PubMed ID: 15627833
TITLE: Effects of advanced glycation end products on hyaluronan photolysis: a new mechanism of diabetic vitreopathy.
AUTHOR: Katsumura Chihiro; Sugiyama Tetsuya; Nakamura Kimitoshi; Obayashi Hiroshi; Hasegawa Goji; Oku Hidehiro; Ikeda Tsunehiko
CORPORATE SOURCE: Department of Ophthalmology, Osaka Medical College, Takatsuki, Osaka, Japan.
SOURCE: Ophthalmic research, (2004 Nov-Dec) Vol. 36, No. 6, pp. 327-31.
Journal code: 0267442. ISSN: 0030-3747.
PUB. COUNTRY: Switzerland
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200502
ENTRY DATE: Entered STN: 4 Jan 2005
Last Updated on STN: 16 Feb 2005
Entered Medline: 14 Feb 2005

AB PURPOSE: To test the effects of advanced glycation end products (AGEs), which are increased in vitreous of diabetic patients, on photolysis of hyaluronan. METHODS: Pullulan standards were used as molecular weight (MW) markers to obtain a calibration curve. 0.02% hyaluronan solutions were divided into AGE-added and AGE-free samples; each sample was irradiated using a xenon lamp or kept in the dark. Retention time (RT) was measured for each sample using high-performance liquid chromatography. RESULTS: RTs and logarithm of MW of pullulan standards were negatively correlated. In hyaluronan samples exposed to light, RT increased significantly for both AGE-added and AGE-free samples compared with samples kept in the dark. RT in AGE-added samples was greater by 3% than that in AGE-free samples ($p = 0.02$). CONCLUSIONS: Exposure to light decreases MW of hyaluronan; addition of AGEs promotes this change. The photosensitizer activity of AGEs may be associated with accelerated depolymerization of hyaluronan in diabetic patients.

L13 ANSWER 2 OF 2 MEDLINE on STN
ACCESSION NUMBER: 2002168385 MEDLINE
DOCUMENT NUMBER: PubMed ID: 11900113
TITLE: Production and characterization of pullulan from beet molasses using a nonpigmented strain of Aureobasidium pullulans in batch culture.
AUTHOR: Lazaridou Athina; Biliaderis Costas G; Roukas Triantafyllos; Izydorczyk Marta
CORPORATE SOURCE: Department of Food Science and Technology, Aristotle University of Thessaloniki, Greece.
SOURCE: Applied biochemistry and biotechnology, (2002 Jan) Vol. 97, No. 1, pp. 1-22.
Journal code: 8208561. ISSN: 0273-2289.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200209
ENTRY DATE: Entered STN: 20 Mar 2002
Last Updated on STN: 12 Sep 2002
Entered Medline: 11 Sep 2002

AB The production of pullulan from beet molasses by a pigment-free strain of Aztreobasidium pullulans on shake-flask culture was investigated. Combined pretreatment of molasses with sulfuric acid and

activated carbon to remove potential fermentation inhibitors present in molasses resulted in a maximum pullulan concentration of 24 g/L, a biomass dry wt of 14 g/L, a pullulan yield of 52.5%, and a sugar utilization of 92% with optimum fermentation conditions (initial sugar concentration of 50 g/L and initial pH of 7.0). The addition of other nutrients as carbon and nitrogen supplements (olive oil, ammonium sulfate, yeast extract) did not further improve the production of the exopolysaccharides. Structural characterization of the isolated polysaccharides from the fermentation broths by 13C-nuclear magnetic resonance spectroscopy and pullulanase digestion combined with size-exclusion chromatography confirmed the identity of pullulan and the homogeneity (>93% dry basis) of the elaborated polysaccharides by the microorganism. Using multiangle laser light scattering and refractive index detectors in conjunction with high-performance size-exclusion chromatography molecular size distributions and estimates of the molecular weight (Mw = 2.1-4.1 x 10(5)), root mean square of the radius of gyration (R = 30-38 nm), and polydispersity index (Mw/Mn = 1.4-2.4) were obtained. The fermentation products of molasses pretreated with sulfuric acid and/or activated carbon were more homogeneous and free of contaminating proteins. In the concentration range of 2.8-10.0 (w/v), the solution's rheologic behavior of the isolated pullulans was almost Newtonian (within 1 and 1200 s(-1) at 20 degrees C); a slight shear thinning was observed at 10.0 (w/v) for the high molecular weight samples. Overall, beet molasses pretreated with sulfuric acid and activated carbon appears as an attractive fermentation medium for the production of pullulan by A. pullulans.

L15 ANSWER 1 OF 4 MEDLINE on STN
ACCESSION NUMBER: 2003362825 MEDLINE
DOCUMENT NUMBER: PubMed ID: 12895565
TITLE: Highly thermostable amylase and pullulanase of the extreme thermophilic eubacterium Rhodothermus marinus: production and partial characterization.
AUTHOR: Gomes I; Gomes J; Steiner W
CORPORATE SOURCE: Bangladesh Jute Research Institute, Manik Mian Avenue, 1207 Dhaka, Bangladesh.
SOURCE: Bioresource technology, (2003 Nov) Vol. 90, No. 2, pp. 207-14.
Journal code: 9889523. ISSN: 0960-8524.
PUB. COUNTRY: England: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200311
ENTRY DATE: Entered STN: 5 Aug 2003
Last Updated on STN: 13 Nov 2003
Entered Medline: 12 Nov 2003

AB Five strains of the extreme thermophilic Rhodothermus marinus were screened for the production of amylolytic and pullulytic activities. The culture medium for the selected strain, R. marinus ITI 990, was optimized using central composite designs for enhanced enzyme production. The optimized medium containing 1.5 gl(-1) of maltose and 8.3 gl(-1) of yeast extract yielded amylase, pullulanase and alpha-glucosidase activities of 45, 33 and 2.1 nkatml(-1), respectively. Among the various carbon sources tested, maltose was most effective for the formation of these enzymes, followed by soluble maize starch, glycogen and pullulan. The crude amylase and pullulanase showed maximum activities at pH 6.5-7.0, and 85 and 80 degrees C, respectively. At 85 degrees C amylase and pullulanase had half lives of 3 h and 30 min, respectively.

L15 ANSWER 2 OF 4 MEDLINE on STN
ACCESSION NUMBER: 97215585 MEDLINE
DOCUMENT NUMBER: PubMed ID: 9121381
TITLE: Pullulan production by Aureobasidium pullulans grown on ethanol stillage as a nitrogen source.
AUTHOR: West T P; Strohfus B
CORPORATE SOURCE: Olson Biochemistry Laboratories, Department of Chemistry and Biochemistry, South Dakota State University, Brookings 57007, USA.
SOURCE: Microbios, (1996) Vol. 88, No. 354, pp. 7-18.
Journal code: 0207257. ISSN: 0026-2633.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199704
ENTRY DATE: Entered STN: 6 May 1997
Last Updated on STN: 29 Jan 1999
Entered Medline: 21 Apr 1997

AB Pullulan production by Aureobasidium pullulans strain RP-1 using thin stillage from fuel ethanol production as a nitrogen source was studied in a medium using corn syrup as a carbon source. The use of 1% thin stillage as a nitrogen source instead of ammonium sulphate elevated polysaccharide production by strain RP-1 cells when grown on a concentration of up to 7.5% corn syrup, independent of yeast extract supplementation. Dry weights of cells grown in medium containing ammonium sulphate as the nitrogen source were higher than the stillage-grown cells after 7 days of growth. The viscosity of the polysaccharide on day 7 was higher for cells grown on thin stillage rather

than ammonium sulphate as a nitrogen source. The pullulan content of the polysaccharide elaborated by ammonium sulphate-grown cells on day 7 was higher than the pullulan content of polysaccharide produced by stillage-grown cells regardless of whether yeast extract was added to the culture medium.

L15 ANSWER 3 OF 4 MEDLINE on STN
ACCESSION NUMBER: 95244580 MEDLINE
DOCUMENT NUMBER: PubMed ID: 7727505
TITLE: Purification and characterization of an alkaline amylopullulanase with both alpha-1,4 and alpha-1,6 hydrolytic activity from alkalophilic Bacillus sp. KSM-1378.
AUTHOR: Ara K; Saeki K; Igarashi K; Takaiwa M; Uemura T; Hagihara H; Kawai S; Ito S
CORPORATE SOURCE: Tochigi Research Laboratories of Kao Corporation, Japan.
SOURCE: Biochimica et biophysica acta, (1995 Apr 13) Vol. 1243, No. 3, pp. 315-24.
Journal code: 0217513. ISSN: 0006-3002.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199505
ENTRY DATE: Entered STN: 8 Jun 1995
Last Updated on STN: 3 Feb 1997
Entered Medline: 30 May 1995

AB The novel alkaline amylopullulanase produced by alkalophilic Bacillus sp. KSM-1378 was purified to an electrophoretically homogeneous state from culture medium. The purified enzyme was a glycoprotein with an apparent molecular mass of about 210 kDa and an isoelectric point of pH 4.8. The N-terminal amino acid sequence was Glu-Thr-Gly-Asp-Lys-Arg-Ile-Glu-Phe-Ser-Tyr-Glu-Arg-Pro and showed no homology to the N-terminal regions of other amylopullulanases reported to date. The enzyme was able to attack specifically the alpha-1,6 linkages in pullulan to generate maltotriose as the major end product, as well as the alpha-1,4 linkages in amylose, amylopectin and glycogen to generate various oligosaccharides. The pH and temperature optima for the pullulanase and alpha-amylase activities were pH 9.5 and 50 degrees C and pH 8.5 and 50 degrees C respectively. Both activities were strongly inhibited by well characterized inhibitors, such as diethyl pyrocarbonate and N-bromosuccinimide. The pullulanase activity was specifically inactivated by Hg2+ ions, alpha-cyclodextrin and beta-cyclodextrin while the amylase activity was strongly inhibited by EDTA and EGTA, although inhibition could be reversed by Ca2+ ions. It is suggested that the single alkaline amylopullulanase protein has two different active sites, one for the cleavage of alpha-1,4-linked substrates and one for the cleavage of alpha-1,6-linked substrates.

L15 ANSWER 4 OF 4 MEDLINE on STN
ACCESSION NUMBER: 90338987 MEDLINE
DOCUMENT NUMBER: PubMed ID: 2116499
TITLE: Comparison of two glucoamylases from Hormoconis resinae.
AUTHOR: Fagerstrom R; Vainio A; Suoranta K; Pakula T; Kalkkinen N; Torkkeli H
CORPORATE SOURCE: Research Laboratories, Alko Ltd, Helsinki, Finland.
SOURCE: Journal of general microbiology, (1990 May) Vol. 136, No. 5, pp. 913-20.
Journal code: 0375371. ISSN: 0022-1287.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199009

ENTRY DATE: Entered STN: 12 Oct 1990
Last Updated on STN: 29 Jan 1999
Entered Medline: 10 Sep 1990

AB Two extracellular glucoamylases (EC 3.2.1.3), glucoamylase P and glucoamylase S, were purified to homogeneity from the culture medium of Hormoconis resinae (ATCC 20495; formerly Cladosporium resinae) by a new method. Their apparent molecular masses (71 kDa glucoamylase P; 78 kDa glucoamylase S) and catalytic properties agreed well with those previously reported in the literature. Heat inactivation studies suggested that the high debranching (1,6-glycosidic) activity of glucoamylase P preparations (measured with pullulan) may reside in the same protein molecule as its 1,4-glycosidic activity (measured with soluble starch). Although glucoamylase S had virtually no debranching activity, it cross-reacted with polyclonal antibodies raised against glucoamylase P, and the two enzymes had very similar amino acid compositions. However, peptide mapping and amino-terminal sequencing studies of the peptides showed that the two enzymes have different sequences and must be encoded by different genes.

L15 ANSWER 1 OF 4 MEDLINE on STN
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L15 ANSWER 2 OF 4 MEDLINE on STN
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TITLE: Pullulan production by Aureobasidium pullulans grown on ethanol stillage as a nitrogen source.
AUTHOR: West T P; Strohfus B
CORPORATE SOURCE: Olson Biochemistry Laboratories, Department of Chemistry and Biochemistry, South Dakota State University, Brookings 57007, USA.
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than ammonium sulphate as a nitrogen source. The pullulan content of the polysaccharide elaborated by ammonium sulphate-grown cells on day 7 was higher than the pullulan content of polysaccharide produced by stillage-grown cells regardless of whether yeast extract was added to the culture medium.

L15 ANSWER 3 OF 4 MEDLINE on STN
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AUTHOR: Ara K; Saeki K; Igarashi K; Takaiwa M; Uemura T; Hagihara H; Kawai S; Ito S
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Journal code: 0217513. ISSN: 0006-3002.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
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L15 ANSWER 4 OF 4 MEDLINE on STN
ACCESSION NUMBER: 90338987 MEDLINE
DOCUMENT NUMBER: PubMed ID: 2116499
TITLE: Comparison of two glucoamylases from Hormoconis resinae.
AUTHOR: Fagerstrom R; Vainio A; Suoranta K; Pakula T; Kalkkinen N; Torkkeli H
CORPORATE SOURCE: Research Laboratories, Alko Ltd, Helsinki, Finland.
SOURCE: Journal of general microbiology, (1990 May) Vol. 136, No. 5, pp. 913-20.
Journal code: 0375371. ISSN: 0022-1287.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199009

ENTRY DATE: Entered STN: 12 Oct 1990
Last Updated on STN: 29 Jan 1999
Entered Medline: 10 Sep 1990

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(FILE 'HOME' ENTERED AT 16:03:29 ON 09 NOV 2006)

FILE 'CAPLUS, MEDLINE' ENTERED AT 16:03:44 ON 09 NOV 2006

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L1            9 S PULLULAN (P) WT% (P) MW (P) VISCOS?
L2            0 S PULLULAN (P) 20WT% (P) MW (P) VISCOS?
L3            0 S PULLULAN (P) 20WT% (P) MW
L4            0 S PULLULAN (P) 20 WT% (P) MW
L5            0 S PULLULAN (P) 20 W/W (P) MW
L6            0 S PULLULAN (P) 20 "W/W" (P) MW
L7            0 S PULLULAN (P) "W/W" (P) MW
L8            3 S PULLULAN (P) "W/W"
L9           11 S PULLULAN (P) MW (P) VISCOS?
L10          11 S L9 NOT L8
L11           2 S L9 NOT L1
L12           2 S PULLULAN (P) MW (P) LIQUID?
L13           2 S PULLULAN (P) MW (P) SOLUTION?
L14          47 S PULLULAN (P) CULTURE MEDIUM
L15           4 S L14 AND CONCENTR?
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=> s l14 NOT L15
L16 43 L14 NOT L15

=> d L16 20-43 ibib abs

L16 ANSWER 20 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:513719 CAPLUS
DOCUMENT NUMBER: 119:113719
TITLE: Activity and origin of digestive enzymes in gut of the tropical earthworm Pontoscolex corethrurus
AUTHOR(S): Zhang, B. G.; Rouland, C.; Lattaud, C.; Lavelle, P.
CORPORATE SOURCE: ORSTOM, Univ. Paris VI, Bondy, 93143, Fr.
SOURCE: European Journal of Soil Biology (1993), 29(1), 7-11
CODEN: EJSBE2; ISSN: 1164-5563
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Activities of glucidic digestive enzymes in the gut (content plus walls) of a tropical endogeic earthworm, P. corethrurus, have been assayed. In order to determine the origin of the enzymes found in the gut, the wall tissues were culture in vitro, and enzymic activities were measured both in the cultured tissues and in the culture medium. The earthworm possesses a weak but quite complete enzyme system. In the gut, the enzymes were capable of degrading the following substrates: heteroside

(N-acetylglucosamine), oligosaccharides (maltose laminaribiose) and polysaccharides (starch, laminaran, pullulan, microcryst. cellulose, CM-cellulose, mannan, glucomannan and carob galactomannan, lichenin). The strongest enzymic activities were located in the foregut and midgut. Among the main enzymes found in the gut, neither cellulase and mannanase was neither detected in the cultured tissues or in the culture medium, which indicates that these 2 enzymes were produced by microorganisms ingested with the soil. The oligosaccharidase and heterosidase activities were higher in the cultured tissues than in the medium, which was not the case for the polysaccharides.

L16 ANSWER 21 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:167512 CAPLUS
DOCUMENT NUMBER: 118:167512
TITLE: Control of molecular weight distribution of the biopolymer pullulan produced by Aureobasidium pullulans
AUTHOR(S): Wiley, B. J.; Ball, D. H.; Arcidiacono, S. M.; Sousa, S.; Mayer, J. M.; Kaplan, D. L.
CORPORATE SOURCE: Biotechnol. Div., U.S. Army Natick Res. Dev. Eng. Cent., Natick, MA, 01760-5020, USA
SOURCE: Journal of Environmental Polymer Degradation (1993), 1(1), 3-9
CODEN: JEPDED; ISSN: 1064-7546
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The effects of C, N, and P sources, along with concentration, were determined on the weight average mol. weight, mol. weight distribution, and yield of pullulan produced by A. pullulans NRRL-Y 6220. Batch systems, scale-up batch, and continuous fermns. of 1 L and 10 L were also evaluated, as were processing variables, including solvents and extraction conditions. Products with weight average mol. weight from 1.0 + 105 to 4.0 + 106 were produced in 100-g quantities by varying fermentation conditions such as constituents of the culture medium, pH, and length of incubation. Three sets of culture conditions were defined for the formation of low (<5.0 + 105), medium (1.0-2.0 + 106), and high (>2.0 + 106) weight average mol. weight polymer. These defined mol. weight fractions of pullulan were used in further studies in producing films and fibers.

L16 ANSWER 22 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:97757 CAPLUS
DOCUMENT NUMBER: 118:97757
TITLE: Influence of vitamins and mineral salts upon pullulan synthesis of Aureobasidium pullulans
AUTHOR(S): West, Thomas P.; Reed-Hamer, Beth
CORPORATE SOURCE: Dep. Chem., South Dakota State Univ., Brookings, SD, 57007, USA
SOURCE: Microbios (1992), 71(287), 115-23
CODEN: MCBIA7; ISSN: 0026-2633
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The effects of vitamins and mineral salts on pullulan synthesis by A. pollulans ATCC 42023 and on cell dry wt of this fungus were explored using either sucrose or corn syrup as a C source. Biotin increased pullulan elaboration and cell dry weight following growth in culture medium containing sucrose. None of the vitamins screened enhanced fungal pullulan synthesis or cell growth when included in the culture medium containing corn syrup. For either C source, thiamin addition to the culture medium did not result in elevated pullulan concentration The presence of

myo-inositol in sucrose-containing culture medium caused a slight increase in fungal pullulan production Supplementation of FeCl3 or MnCl2 to sucrose-containing medium resulted in an increase in the pullulan concentration and a slight elevation of cell dry weight relative to their resp. controls. In corn syrup-containing culture medium, the addition of ZnCl2 or, to a lesser extent, FeCl3 increased fungal synthesis of pullulan several-fold, while only ZnCl2 caused cell dry weight to more than double.

L16 ANSWER 23 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1992:610727 CAPLUS
DOCUMENT NUMBER: 117:210727
TITLE: Saccharification of polysaccharides by using alkaline pullulanase Y with α-amylase activity and manufacture of sugars
INVENTOR(S): Ara, Katsutoshi; Saeki, Katsuhisa; Igarashi, Kazuaki; Ito, Susumu
PATENT ASSIGNEE(S): Kao K. K., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 04094694	A2	19920326	JP 1990-211955	19900810
JP 2866460	B2	19990308		
PRIORITY APPLN. INFO.:			JP 1990-211955	19900810

AB The alkaline pullulanase Y (I) of Bacillus sp. is used for Saccharification of polysaccharides and for manufacture of sugars from (soluble) starch. Bacillus sp.
KSM-AP1378 was shake-cultured in a medium containing pullulan, soluble starch, trypton, yeast extract, and salts (pH 10.0) at 30° for 3 days, and centrifuged to give crude I solution (0.2 g/1 L culture medium), which had α-amylase activity (pH 9) of 2476 U/L. The crude I solution and liquefying starch (DE value 4.2; 1 g as solid component) were mixed to 10 mL total volume and incubated at 50° for 2 days (pH ≈8) to give a saccharification solution comprising 3.2% glucose, 12.3% maltose, 13.1% maltotriose, 33.1% maltotetraose, 23.4% maltopentaose, 1.5% maltohexaose, and 13.4% other sugars.

L16 ANSWER 24 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1991:602996 CAPLUS
DOCUMENT NUMBER: 115:202996
TITLE: Ability of Aureobasidium pullulans to synthesize pullulan upon selected sources of carbon and nitrogen
AUTHOR(S): West, Thomas P.; Reed-Hamer, Beth
CORPORATE SOURCE: Dep. Chem., South Dakota State Univ., Brookings, SD, 57007, USA
SOURCE: Microbios (1991), 67(271), 117-24
CODEN: MCBIA7; ISSN: 0026-2633
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The effect of carbon and nitrogen sources upon the level of pullulan synthesized by A. pullulans ATCC 42023 was examined In addition, cell dry weight and the final pH of the culture medium was investigated after fungal growth upon the selected carbon source or nitrogen sources. The carbon sources studied included sucrose, glucose, fructose, maltose and corn syrup, while the nitrogen sources studied were ammonium nitrate, ammonium sulfate, ammonium tartrate, sodium nitrate, asparagine and urea. After 5 days at 30°, the level of pullulan found was maximal upon sucrose

while the lowest level was noted on maltose. Cell dry weight remained relatively constant independent of the carbon source used while the pH of the culture medium dropped significantly. The amount of pullulan synthesized was not proportional to the concentration of carbon source present. Pullulan synthesis seemed to be inhibited when the carbon source concentration was increased in batch culture. With respect to the nitrogen sources screened, ammonium tartrate and asparagine stimulated maximal pullulan synthesis while urea allowed little pullulan synthesis.

L16 ANSWER 25 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1990:493718 CAPLUS
DOCUMENT NUMBER: 113:93718
TITLE: Comparison of two glucoamylases from Hormoconis resinae
AUTHOR(S): Fagerstrom, Richard; Vainio, Arja; Suoranta, Kari; Pakula, Tiina; Kalkkinen, Nisse; Torkkeli, Helena
CORPORATE SOURCE: Res. Lab., Alko Ltd., Helsinki, SF-00101, Finland
SOURCE: Journal of General Microbiology (1990), 136(5), 913-20
CODEN: JGMIAN; ISSN: 0022-1287
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Two extracellular glucoamylases (EC 3.2.1.3), glucoamylase P and glucoamylase S, were purified to homogeneity from the culture medium of H. resinae (ATCC20495; formerly Cladosporium resinea) by a new method. Their apparent mol. masses (71-kDa glucoamylase P; 78-kDa glucoamylase S) and catalytic properties agreed well with those previously reported in the literature. Heat inactivation studies suggested that the high debranching (1,6-glycosidic) activity of glucoamylase P prepns. (measured with pullulan) may reside in the same protein as its 1,4-glycosidic activity (measured with soluble starch). Although glucoamylase S had virtually no debranching activity, it crossreacted with polyclonal antibodies raised against glucoamylase P, and the 2 enzymes had very similar amino acid compns. However, peptide mapping and amino-terminal sequencing studies of the peptides showed the 2 enzymes have different sequences and must be encoded by different genes.

L16 ANSWER 26 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1988:73765 CAPLUS
DOCUMENT NUMBER: 108:73765
TITLE: Aureobasillan, a novel β-o-glucan from Aureobasidium, and its use in chemicals foods, and pharmaceuticals
INVENTOR(S): Misaki, Akira; Sone, Yoshiaki; Mitsuhashi, Masakazu; Miyake, Toshio
PATENT ASSIGNEE(S): Hayashibara Biochemical Laboratories, Inc., Japan
SOURCE: Eur. Pat. Appl., 43 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 236124	A2	19870909	EP 1987-301847	19870303
EP 236124	A3	19880420		
EP 236124	B1	19940601		
R: FR, GB, IT				
JP 62201901	A2	19870905	JP 1986-44189	19860303
JP 06092441	B4	19941116		
CA 1335579	A1	19950516	CA 1987-530487	19870224
US 4965347	A	19901023	US 1987-19186	19870225

PRIORITY APPLN. INFO.: JP 1986-44189 A 19860303

AB Aureobasillan, a β-D-glucan with antitumor and anticholesteremic activity which can be derivatized and used in foods, is prepared from the cell walls of Aureobasidium. a. pullulans IF04464 was cultured for 5 days at 27° in 20 L culture medium. The culture was filtered and 1.4 kg pullulan prepared from the filtrate. The cells (.apprx.200 g) were washed with hot water, defatted with acetone, and mixed with 4 L 0.5N NaOH for 4 h. The supernatant from centrifugation of this mixture was dialyzed, concentrated, and dehydrated to prepare 8 g crude Aureobasillan. DEAE-cellulose column chromatog. was used to prepare 400 mg Aureoasillan A (nonabsorbed fraction) and 500 mg Aureobasillan B (eluted with 0.1N NaOH). In mice, both Aureobasillans were effective antitumor agents (against sarcoma 180 tumors and Lewis lung cancer) and were extremely low in toxicity.

L16 ANSWER 27 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1987:574406 CAPLUS
DOCUMENT NUMBER: 107:174406
TITLE: Aureobasidium pullulans mutants which produce little melanin, and their use to prepare melanin-free pullulan
INVENTOR(S): Boeck, August; Lechner, Konrad; Huber, Otto
PATENT ASSIGNEE(S): Consortium fuer Elektrochemische Industrie G.m.b.H., Fed. Rep. Ger.
SOURCE: Ger. Offen., 3 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 3539180	A1	19870507	DE 1985-3539180	19851105
JP 62111681	A2	19870522	JP 1986-258693	19861031
JP 04018835	B4	19920327		
CA 1313156	A1	19930126	CA 1986-521954	19861031
EP 222302	A2	19870520	EP 1986-115267	19861104
EP 222302	A3	19880803		
EP 222302	B1	19920527		
R: AT, CH, DE, FR, GB, IT, LI, NL, SE				
AT 76661	E	19920615	AT 1986-115267	19861104
US 5019514	A	19910528	US 1989-471112	19891127

PRIORITY APPLN. INFO.:
DE 1985-3539180 A 19851105
US 1986-925708 B1 19861030
EP 1986-115267 A 19861104

AB An Aureobasidium pullulans mutant, which produces little or no melanin, can be used to prepare melanin-free pullulan for use as a dextran substitute in infusion liqs. A. pullulans ATCC 9348 was UV mutagenized and grown on agar plates for 8 days at 4°. Nonpigmented colonies were selected and one (P56) was grown in medium (pH 5.5) containing salts, (NH4)2SO4 0.6, yeast extract 0.4, and saccharose 30 g/L. White pullulan was prepared from the culture medium by EtOH precipitation; that prepared from a culture of the parent strain was an intense green-black color.

L16 ANSWER 28 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1987:83044 CAPLUS
DOCUMENT NUMBER: 106:83044
TITLE: Thermostable pullulanase enzyme
INVENTOR(S): Katkocin, Dennis M.; Zeman, Nancy W.; Yang, Shiow Shong
PATENT ASSIGNEE(S): CPC International Inc., USA

SOURCE: U.S., 6 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4628028	A	19861209	US 1985-737309	19850523

PRIORITY APPLN. INFO.: US 1985-737309 19850523

AB Pullulanase exhibiting thermostability at pH .apprx.5 is produced by cultivation of Thermoanaerobium brockii. The enzyme retains ≥50% of its pullulan-hydrolyzing activity at 70° for 100 min at pH 5.0. T. brockii Was cultivated anaerobically in a medium containing maltodextrin, cottonseed meal, and yeast extract Nicotinic acid, D-pantothenic acid, and MgSO4 markedly increased pullulanase yield. The enzyme was excreted into the culture medium and is used for maltotriose preparation

L16 ANSWER 29 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1985:592738 CAPLUS
DOCUMENT NUMBER: 103:192738
TITLE: β-Streptococcus selective medium
INVENTOR(S): Robinson, John M.; Rodgers, Gregory D.
PATENT ASSIGNEE(S): Vitek Systems, Inc., USA
SOURCE: U.S., 4 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4532206	A	19850730	US 1982-399782	19820719

PRIORITY APPLN. INFO.: US 1982-399782 19820719

AB A β-streptococcus selective medium is described for the growth and detection of β-hemolytic streptococci, without allowing for the growth of enterococci and other non-β-hemolytic streptococci. The culture medium consists of pullulan as a carbohydrate source, a protein source, inhibitors of the growth of Pseudomonas, other gram neg. organisms, and staphylococci, and reduced Aniline Blue indicator. Thus, β-streptococci were detected in an automatic microbial analyzer by using a medium composed of proteose peptone #3, biosate, NaCl, bovine serum albumin, vitamin B12, Na thioglycollate, thallous acetate, nalidixic acid, gentamycin, and reduced Aniline Blue. If β-streptococci are present, the medium will change from red to blue and be detected as a pos. culture. In contrast to known mediums, blood cells need not be incorporated into the medium for β-streptococcus detection.

L16 ANSWER 30 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1985:434497 CAPLUS
DOCUMENT NUMBER: 103:34497
TITLE: A plate culture method for the simultaneous detection of bacteria producing pullulan- and/or starch-hydrolyzing enzymes
AUTHOR(S): Kanno, Mutsuo; Tomimura, Eijiro
CORPORATE SOURCE: Nakatani Mem. Lab., CPC Japan Ltd., Tokyo, 102, Japan
SOURCE: Agricultural and Biological Chemistry (1985), 49(5), 1529-30
CODEN: ABCHA6; ISSN: 0002-1369
DOCUMENT TYPE: Journal

LANGUAGE: English

AB A new plate culture method is described for the simultaneous detection and isolation of pullulanase- and α-amylase-producing bacteria. The method involves culturing the bacteria in a medium consisting of agar, starch, blue-colored amylose (amylose covalently linked to Brilliant Blue R), red-colored pullulan (pullulan covalently linked to Brilliant Red 5BS), yeast extract, Bacto-tryptone, and salts, pH 4.0 or 6.0. Formation of red and blue zones occurs around colonies producing α-amylase and pullulanase, resp., whereas colonies producing both enzymes form clear zones. The method was confirmed for the isolation of thermophilic aerobic soil bacteria.

L16 ANSWER 31 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1985:147463 CAPLUS

DOCUMENT NUMBER: 102:147463

TITLE: Effect of pH on the batch fermentation of pullulan from sucrose medium

AUTHOR(S): Lacroix, Carine; LeDuy, Anh; Noel, Gaetan; Choplin, Lionel

CORPORATE SOURCE: Dep. Chem. Eng., Laval Univ., Sainte-Foy, QC, G1K 7P4, Can.

SOURCE: Biotechnology and Bioengineering (1985), 27(2), 202-7
CODEN: BIBIAU; ISSN: 0006-3592

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Two strains of the yeast-like fungus Aureobasidium pullulans 2552 and 140B were used for the fermentative production of the polysaccharide pullulan [9057-02-7] from a sucrose synthetic medium. In the batch fermentation, either in Erlenmeyer flasks or in the fermentor, the pH of the culture medium decreased rapidly from its initial value of 5.5 to the self-stabilized final value of 2.5 within 24 h. At very low initial pH values, e.g. pH 2, the polysaccharide production was insignificant. However, the biomass concentration that was obtained was very high at this low initial pH value. A 2-stage fermentation process for the production of pullulan was developed. The 1st stage of fermentation was conducted at the very acidic pH for the best production of biomass. When the biomass concentration reached its maximum value, the 2nd stage of fermentation was initiated by adjustment of the medium pH to a higher value for the promotion of polysaccharide synthesis. Expts. conducted in Erlenmeyers and in the fermentor confirmed this concept. The 2-stage process enhanced the polysaccharide concentration in the medium, influenced the rheol. properties of the fermentation broth, and has the potential for operation under nonsterile and nonaseptic conditions.

L16 ANSWER 32 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1984:532878 CAPLUS

DOCUMENT NUMBER: 101:132878

TITLE: Peat hydrolyzate medium optimization for pullulan production

AUTHOR(S): Boa, Jacques M.; LeDuy, Anh

CORPORATE SOURCE: Dep. Chem. Eng., Laval Univ., Sainte-Foy, QC, G1K 7P4, Can.

SOURCE: Applied and Environmental Microbiology (1984), 48(1), 26-30
CODEN: AEMIDF; ISSN: 0099-2240

DOCUMENT TYPE: Journal

LANGUAGE: English

AB For the production of pullulan (I) [9057-02-7] from peat moss hydrolyzate by fermentation with Aureobasidium pullulans, the addition of (NH4)2SO4 and K2HPO4 as N and phosphate supplements, resp., was not necessary, and the optimal initial PH was 6.0. The optimized culture

medium had peat hydrolyzate containing total carbohydrate 4-5, NaCl 0.05, MgSO4 0.02,and antifoaming agent 0.01%. Ca(OH)2 was used to raise the pH of the hydrolyzate from 1.0 to 6.0. The I obtained (taking into account the inhibiting effect of the antifoaming agent) was 12-14 and 9-10 kg/L for nonoptimized and optimized [no (NH4)2SO4 or K2HPO4] media, resp.

L16 ANSWER 33 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1983:538127 CAPLUS
DOCUMENT NUMBER: 99:138127
TITLE: Tests on the conditions for pullulan fermentation
AUTHOR(S): Xu, Chunxi; Wang, Shizhuo; Xu, Guanzhu; Dan, Jialin
CORPORATE SOURCE: Inst. Microbiol., Acad. Sin., Beijing, Peop. Rep. China
SOURCE: Weishengwuxue Tongbao (1983), 10(3), 109-12
CODEN: WSWPDI; ISSN: 0253-2654
DOCUMENT TYPE: Journal
LANGUAGE: Chinese
AB The effects of various culture medium components and conditions were studied on production of pullulan (I) [9057-02-7] from sucrose [57-50-1] by fermentation with Aureobasidium pullulans N28. The production of I was high when A. pullulans N28 was incubated in a fermentation The production of I was high when A. pollulans N28 was incubated in a fermentation medium (pH 6.0) containing sucrose 50, (NH4)2SO4 0.3, yeast extract 2.5, KH2PO4 2.0, MgSO4.7H2O 0.1, and NaCl 1.0 g/L; when this fermentation system was incubated at 29-30°, I production reached peak values in 5 days.

L16 ANSWER 34 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1983:67983 CAPLUS
DOCUMENT NUMBER: 98:67983
TITLE: Spontaneous and ultraviolet radiation-induced variability of pullulan synthesizing strains of Pullularia (Aureobasidium) pullulans of varying ploidy
AUTHOR(S): Imshenetskii, A. A.; Kondrateva, T. F.; Smut'ko, A. N.
CORPORATE SOURCE: Inst. Mikrobiol., Moscow, USSR
SOURCE: Mikrobiologiya (1982), 51(6), 964-7
CODEN: MIKBA5; ISSN: 0026-3656
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The spontaneous and UV radiation-induced formation of pullulan by P. pullulans was greatest in tetraploid and least in haploid strains. UV radiation increased the number of plus variants and also produced variants which accumulated more pullulan in the culture medium than did the most active variant resulting from spontaneous mutation. UV radiation produced a diploid variant which accumulated 24% more pullulan than did the control culture and 2.17-fold more than the haploid cultures.

L16 ANSWER 35 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1983:13510 CAPLUS
DOCUMENT NUMBER: 98:13510
TITLE: Purification and some properties of an extracellular exomaltohexaohydrolase from an Aerobacter aerogenes mutant
AUTHOR(S): Nakakuki, Teruo; Azuma, Keiko; Monma, Mitsuru; Kainuma, Keiji
CORPORATE SOURCE: Natl. Food Res. Inst., Tsukuba, 305, Japan
SOURCE: Denpun Kagaku (1982), 29(3), 188-97
CODEN: DPNKAV; ISSN: 0366-9580
DOCUMENT TYPE: Journal
LANGUAGE: English
AB An extracellular exomaltohexaohydrolase (I) was purified from a culture medium of A. aerogenes by fractionation with (NH4)2SO4 and column chromatog. on DEAE-cellulose and Sephadex G-100. The

mol. weight of I was estimated to be 65,000 and 48,000 by SDS-polyacrylamide gel
electrophoresis and gel filtration on Sephadex G-100, resp. I showed 3 bands with isoelec. points of 7.2, 7.6, and 7.7. I showed maximum activity at 52° and pH 7, and was stable at pH 5-10 at <50°. The thermostability was improved by Ca2+. I produced maltohexaose from starch, amylose, and amylopectin by an exo-attack action mechanism, but did not act on α-, β-, and γ-cyclodextrin, pullulan, or maltose. I acted on β-limit dextrins of amylopectin and glycogen to form branched oligosaccharides. These characteristics of purified I were similar to those of cell-bound I.

L16 ANSWER 36 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1978:103360 CAPLUS
DOCUMENT NUMBER: 88:103360
TITLE: Production of pullulan using of amylase inhibitor
INVENTOR(S): Ueda, Seinosuke; Miura, Yoshisuke
PATENT ASSIGNEE(S): Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 52130993	A2	19771102	JP 1976-46968	19760424
JP 58040479	B4	19830906		

PRIORITY APPLN. INFO.: JP 1976-46968 A 19760424
AB Pullulan [9057-02-7] was produced by culturing Aureobasidium pullulans ATCC 9348 on a medium containing an amylase inhibitor. Thus, the microbe was aerobically cultured at 24° for 6 days on a medium containing sucrose 10, K2HPO4 0.5, NaCl 0.1, (NH4)2SO4 0.06, MgSO4.7H2O 0.02, and yeast extract 0.25% with 1100 units of amylase inhibitor from Streptomyces flavochromogenes Number 280 added. Production of pullulan was 5.22 g/dL vs. 4.52 g/dL in a culture without addition of the amylase inhibitor. Viscosity of the culture medium was higher in the lot cultured with addition of the amylase inhibitor.

L16 ANSWER 37 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1977:513656 CAPLUS
DOCUMENT NUMBER: 87:113656
TITLE: Extracellular pullulanase synthesis in Bacillus macerans
AUTHOR(S): Adams, K. R.; Priest, F. G.
CORPORATE SOURCE: Dep. Brew. Biol. Sci., Heriot-Watt Univ., Edinburgh, UK
SOURCE: FEMS Microbiology Letters (1977), 1(5), 269-73
CODEN: FMLED7; ISSN: 0378-1097
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Pullulanase was identified in the culture medium of B. macerans by chromatog. detection of maltotriose, maltohexaose, and small amts. of maltotetraose in aliquots of pullulan digests. No glucose, maltose, or pentasaccharide were detected. The enzyme showed very low rates of hydrolysis of glycogen and amylopectin. The temperature optimum of the enzyme was at 50-55°.

L16 ANSWER 38 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1974:503258 CAPLUS
DOCUMENT NUMBER: 81:103258
TITLE: Crystallized pullulanase
INVENTOR(S): Wallenfels, Kurt; Bender, Hans

PATENT ASSIGNEE(S): Farbwerke Hoechst A.-G.
SOURCE: Ger. Offen., 12 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 2245342	A1	19740321	DE 1972-2245342	19720915
PRIORITY APPLN. INFO.:			DE 1972-2245342 A	19720915

AB A protease-free pullulanase was prepared by cultivating Aerobacter aerogenes in a medium containing maltose and soluble starch or pullulan as the C source under aerobic conditions, separating the cell mass from the culture medium, extracting the cell mass with 0.01-0.1M buffer at pH 7.5-8.7 in the presence of Na cholate and a Mg salt, dialyzing the extract, and isolating the pullulanase by fractional precipitation with acetone in the presence of dodecyl sulfate.

L16 ANSWER 39 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1973:125459 CAPLUS
DOCUMENT NUMBER: 78:125459
TITLE: Pullulan-containing films
INVENTOR(S): Hijiya, Hiromi; Shiosaka, Makoto
PATENT ASSIGNEE(S): Hayashibara Biochemical Laboratories, Inc.
SOURCE: Ger. Offen., 30 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 2235991	A1	19730208	DE 1972-2235991	19720721
DE 2235991	B2	19800306		
DE 2235991	C3	19801023		
JP 48051777	A2	19730720	JP 1971-85960	19711030
JP 52006346	B4	19770221		
US 3784390	A	19740108	US 1972-271378	19720713
AU 7244576	A1	19740117	AU 1972-44576	19720714
GB 1374199	A	19741120	GB 1972-33204	19720714
FI 54133	C	19781010	FI 1972-2037	19720718
NO 138662	C	19781018	NO 1972-2565	19720718
BE 786574	A1	19721116	BE 1972-120130	19720720
ZA 7205017	A	19730425	ZA 1972-5017	19720720
SE 384517	B	19760510	SE 1972-9559	19720720
CA 1007415	A1	19770329	CA 1972-147626	19720720
NL 7210152	A	19730125	NL 1972-10152	19720721
NL 170428	B	19820601		
NL 170428	C	19821101		
FR 2147112	A1	19730309	FR 1972-26432	19720721
BR 7204881	A0	19730612	BR 1972-4881	19720721
CH 564574	A	19750731	CH 1972-10907	19720721
ES 405103	A1	19751116	ES 1972-405103	19720722
PRIORITY APPLN. INFO.:			JP 1971-54579 A	19710723
			JP 1971-85960 A	19711030

AB Water-soluble films of pullulan [9057-02-7] or containing pullulan and <120 weight% amylose, <100 weight%, poly(vinyl alc.) [9002-89-5], or <150 weight% gelatin had high gloss, high transparency, good low-temperature flexibility and were impermeable to O and oil. The films were used as packaging material for butter and cheese. Thus, pullulan

of mol. weight 250,000 and sp. rotation 195.deg., prepared by incubating Dematium pullulans IFO 4464 in a standard culture medium, formed on a steel plate, a 0.02 mm nonadhesive film from an aqueous solution and had a tensile strength of 7.1 kg/mm2, an elongation of 10% and withstood 700 folding cycles. After 1 month at 60% relative humidity the fold strength did not change and the tensile strength was 7.2 kg/mm2.

L16 ANSWER 40 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1971:548826 CAPLUS
DOCUMENT NUMBER: 75:148826
TITLE: Role of pH and nitrogen limitation in the elaboration of the extracellular polysaccharide pullulan by Pullularia pullulans
AUTHOR(S): Catley, B. J.
CORPORATE SOURCE: Sch. Med., Univ. Miami, Miami, FL, USA
SOURCE: Applied Microbiology (1971), 22(4), 650-4
CODEN: APMBAY; ISSN: 0003-6919
DOCUMENT TYPE: Journal
LANGUAGE: English
AB During the growth of the yeastlike fungus P. pullulans on glucose as sole C source, the cell-mass does not increase concomitantly with the elaboration of the extracellular polysaccharide pullulan, but precedes it. The conditions generated in the culture medium which activate the secretion of polysaccharide have been sought, and, in particular, the roles of extracellular pH and N limitation are examined

L16 ANSWER 41 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1968:56853 CAPLUS
DOCUMENT NUMBER: 68:56853
TITLE: Pullulanase (an amylopectin and glycogen debranching enzyme) from Aerobacter aerogenes
AUTHOR(S): Bender, Hans; Wallenfels, Kurt
CORPORATE SOURCE: Univ. Freiburg, Freiburg, Germany
SOURCE: Methods in Enzymology (1966), 8, 555-9
CODEN: MENZAU; ISSN: 0076-6879
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The assay method for pullulanase (I) is based on the determination of maltotriose split off from pullulan by I. I is prepared from A. aerogenes in a modified Czapek culture medium, and is present in the culture filtrate when produced under batchwise cultivation. When produced under conditions of continuous cultivation, it is very tightly bound to the cells, but can be extracted with Na lauryl sulfate. Purified I is obtained by DEAE-cellulose adsorption and (NH4)2SO4 fractionation. The mol. weight is .apprx.145,000 for the I protein. I retains its activity upon dialysis against 0.02M phosphate buffer at 0° and pH 7.2 for 48 hrs. I is active between pH 4.0 and 8.0 with a distinct optimum at pH 5.0; its activity increases with temps. ≤47.5° and then diminishes at higher temps. I attacks the α-1,6-linkage only if there are neighboring α-1,4 linkages; it also attacks glycogen.

L16 ANSWER 42 OF 43 MEDLINE on STN
ACCESSION NUMBER: 2003544320 MEDLINE
DOCUMENT NUMBER: PubMed ID: 12920607
TITLE: Rhizopus microsporus var. rhizopodiformis: a thermotolerant fungus with potential for production of thermostable amylases.
AUTHOR: Peixoto Simone C; Jorge Joao A; Terenzi Hector F; Polizeli Maria de Lourdes T M
CORPORATE SOURCE: Departamento de Biologia, Faculdade de Filosofia Ciencias e Letras de Ribeirao Preto, Universidade de Sao Paulo, Av.

Bandeirantes 3900, 14040-901, Ribeirao Preto SP, Brazil.
SOURCE: International microbiology : the official journal of the Spanish Society for Microbiology, (2003 Dec) Vol. 6, No. 4, pp. 269-73. Electronic Publication: 2003-08-15.
Journal code: 9816585. ISSN: 1139-6709.
PUB. COUNTRY: Spain
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200404
ENTRY DATE: Entered STN: 19 Nov 2003
Last Updated on STN: 17 Apr 2004
Entered Medline: 16 Apr 2004

AB The effect of several nutritional and environmental parameters on growth and amylase production from Rhizopus microsporus var. rhizopodiformis was analysed. This fungus was isolated from soil of the Brazilian "cerrado" and produced high levels of amylolytic activity at 45 degrees C in liquid medium supplemented with starch, sugar cane bagasse, oat meal or cassava flour. Glucose in the culture medium drastically repressed the amylolytic activity. The products of hydrolysis were analysed by thin layer chromatography, and glucose was detected as the main component. The amylolytic activity hydrolysed several substrates, such as amylopectin, amylase, glycogen, pullulan, starch, and maltose. Glucose was always the main end product detected by high-pressure liquid chromatography analysis. These results indicated that the amylolytic activity studied is a glucoamylase, but there were also low levels of alpha-amylase. As compared to other fungi, R. microsporus var. rhizopodiformis can be considered an efficient producer of thermostable amylases, using raw residues of low cost as substrates. This information is of technological value, considering the importance of amylases for industrial hydrolysis.

L16 ANSWER 43 OF 43 MEDLINE on STN
ACCESSION NUMBER: 92246395 MEDLINE
DOCUMENT NUMBER: PubMed ID: 1725841
TITLE: Amylolytic activity of Humicola sp.
AUTHOR: de Oliveira A R; Ximenes E de A; Felix C R
CORPORATE SOURCE: Departamento de Biologia Celular, Universidade de Brasilia, DF.
SOURCE: Anais da Academia Brasileira de Ciencias, (1991 Dec) Vol. 63, No. 4, pp. 409-14.
Journal code: 7503280. ISSN: 0001-3765.
PUB. COUNTRY: Brazil
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199206
ENTRY DATE: Entered STN: 19 Jun 1992
Last Updated on STN: 29 Jan 1999
Entered Medline: 4 Jun 1992

AB The thermophilic and cellulolytic fungus Humicola sp. secretes amylase in the liquid culture medium. This activity is induced by starch, maltose and cellobiose. Glucose impairs accumulation of amylolytic activity in the culture medium. The enzyme hydrolyzes starch, maltose and pullulan to glucose as the end-product.

L16 ANSWER 1 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2006:277128 CAPLUS
DOCUMENT NUMBER: 144:393067
TITLE: Method for producing pullulan
INVENTOR(S): Yu, Shaohua; Yu, Min; Lin, Yuhui; Yang, Hanbin; Liu, Mouquan; Zheng, Huafeng; Huang, He; Yang, Zhijun; Zhou, Xiaona; Chen, Yuanzhi; Li, Hui
PATENT ASSIGNEE(S): Shantou Fuwei Fruits and Nuts Manufacturing Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 9 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1654482	A	20050817	CN 2005-10008439	20050221

PRIORITY APPLN. INFO.: CN 2005-10008439 20050221

AB The method includes the following steps: (1) selectively breeding strain through UV and nitrosoguanidine inducing Aureobasidium pullulans and screening out induced strain with less melanin secretion and high conversion rate; (2) compounding seed culture medium and fermentation culture medium; (3) culturing the obtained strain at 30-33° and inoculating in sterilized and cooled seed culture medium for culture to obtain seed liquid; (4) fermentation through setting sterilized and cooled fermentation culture medium and the obtained seed liquid in the inoculated amount of 1.5-5% into fermentation tank to obtain fermented liquid; and (5) extracting pullulan product from the fermented liquid The seed culture medium with pH 6.0-7.0 comprises ammonia water 0.018-0.022, K2HPO4 0.2-0.45, MgSO4 0.015-0.023, NaCl 0.09-0.11, yeast extract 0.13-0.15 wt%, and balanced corn powder liquefied liquid with DE value of 48-55, glucose solution or maltose solution The fermentation culture medium with pH 7.0 comprises ammonia water 0.018-0.045, K2HPO4 0.2-0.55, MgSO4 0.015-0.045, NaCl 0.09-0.12, yeast extract 0.12-0.16 wt%, and balanced corn powder liquefied liquid with DE value of 48-55, glucose solution or maltose solution The tris buffer solution used in step (1) is prepared by dissolving trimethylolaminomethane 6.1g and malic acid 5.8 g in 980 mL water, adjusting with 1 mol/L NaOH to pH 6.0, fixing volume to 1000 mL. The corn powder liquefied liquid is prepared by adding water and amylase in corn powder, liquefying to dissolve saccharide matter, separating solid out. The seed culture is carried out at 30-33° temperature and 0.5 kg/cm2 tank pressure for 36-42 h under stirring at 400-600 r/min while bubbling sterile air at 1.5-3 L/min. The fermentation is carried out at 29-33° temperature for 72-86 h under stirring at 400-600 r/min while bubbling sterile air at 3-6 L/min.

L16 ANSWER 2 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2006:142658 CAPLUS
DOCUMENT NUMBER: 144:288956
TITLE: Pullulan film and microbial preservation method using the same
INVENTOR(S): Li, Shijie
PATENT ASSIGNEE(S): Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 8 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1644675	A	20050727	CN 2004-10061418	20041223
PRIORITY APPLN. INFO.:			CN 2004-10061418	20041223

AB This invention provides a pullulan film and microbial preservation method using the same, wherein the film is prepared by flow casting and has a thickness of 0.02-0.04 mm, tensile strength of 27-32 MPa, angle tear strength of 31-38 KN/m, transmittancy of 95-98%, and oxygen permeation rate of 2.7-1.6 cm3/m2.bar.d. The method comprises spreading glycerol, trehalose protectant, and microbial inoculum onto the central part of two layers of sterilized pullulan films, sticking tightly, and enclosing with plastic film. The method can provide the conditions required for microbial preservation, such as dryness, oxygen deficiency, low temperature, nutrition deficiency, and addition of protectant. The films carried with microbial strains can be arranged into booklets for the research of microbial sorting, with the advantages of small size, simple operation, no need of expensive equipment, and convenience for mailing and application. A culture of a microorganism can be prepared simply by cutting a small portion from the film on which the microorganism is preserved and dissolving it in a culture medium.

L16 ANSWER 3 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	2003:904147 CAPLUS
DOCUMENT NUMBER:	140:422446
TITLE:	Rhizopus microsporus var.rhizopodiformis: a thermotolerant fungus with potential for production of thermostable amylases
AUTHOR(S):	Peixoto, Simone C.; Jorge, Joao A.; Terenzi, Hector F.; Polizeli, Maria de Lourdes T. M.
CORPORATE SOURCE:	Faculdade de Filosofia Ciencias e Letras de Ribeirao Preto, Departamento de Biologia, Universidade de Sao Paulo, Ribeirao Preto SP, 14040-901, Brazil
SOURCE:	International Microbiology (2003), 6(4), 269-273 CODEN: INMIFW; ISSN: 1139-6709
PUBLISHER:	Springer-Verlag
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB The effect of several nutritional and environmental parameters on growth and amylase production from Rhizopus microsporus var. rhizopodiformis was analyzed. This fungus was isolated from soil of the Brazilian "cerrado" and produced high levels of amylolytic activity at 45°C in liquid medium supplemented with starch, sugar cane bagasse, oat meal or cassava flour. Glucose in the culture medium drastically repressed the amylolytic activity. The products of hydrolysis were analyzed by thin layer chromatog., and glucose was detected as the main component. The amylolytic activity hydrolyzed several substrates, such as amylopectin, amylase, glycogen, pullulan, starch, and maltose. Glucose was always the main end product detected by high-pressure liquid chromatog. anal. These results indicated that the amylolytic activity studied is a glucoamylase, but there were also low levels of α-amylase. As compared to other fungi, R. microsporus var. rhizopodiformis can be considered an efficient producer of thermostable amylases, using raw residues of low cost as substrates. This information is of technol. value, considering the importance of amylases for industrial hydrolysis.

REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 4 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	2003:580542 CAPLUS
DOCUMENT NUMBER:	139:394941
TITLE:	Highly thermostable amylase and pullulanase of the

extreme thermophilic eubacterium Rhodothermus marinus: production and partial characterization
AUTHOR(S): Gomes, I.; Gomes, J.; Steiner, W.
CORPORATE SOURCE: Bangladesh Jute Research Institute, Dhaka, 1207, Bangladesh
SOURCE: Bioresource Technology (2003), 90(2), 207-214
CODEN: BIRTEB; ISSN: 0960-8524
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Five strains of the extreme thermophilic Rhodothermus marinus were screened for the production of amylolytic and pullulolytic activities. The culture medium for the selected strain, R. marinus ITI 990, was optimized using central composite designs for enhanced enzyme production The optimized medium containing 1.5 g l-1 of maltose and 8.3 g l-1 of yeast extract yielded amylase, pullulanase and α-glucosidase activities of 45, 33 and 2.1 nkat ml-1, resp. Among the various carbon sources tested, maltose was most effective for the formation of these enzymes, followed by soluble maize starch, glycogen and pullulan. The crude amylase and pullulanase showed maximum activities at pH 6.5-7.0, and 85 and 80 °C, resp. At 85 °C amylase and pullulanase had half lives of 3 h and 30 min, resp.
REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 5 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1997:166171 CAPLUS
DOCUMENT NUMBER: 126:211074
TITLE: Pullulan production by Aureobasidium pullulans grown on ethanol stillage as a nitrogen source
AUTHOR(S): West, Thomas P.; Strohfus, Beth
CORPORATE SOURCE: Dep. Chem. and Biochem., South Dakota State Univ., Brookings, SD, 57007, USA
SOURCE: Microbios (1996), 88(354), 7-18
CODEN: MCBIA7; ISSN: 0026-2633
PUBLISHER: Faculty Press
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Pullulan production by Aureobasidium pullulans strain RP-1 using thin stillage from fuel ethanol production as a nitrogen source was studied in a medium using corn syrup as a carbon source. The use of 1% thin stillage as a nitrogen source instead of ammonium sulfate elevated polysaccharide production by strain RP-1 cells when grown on a concentration of up to 7.5% corn syrup, independent of yeast extract supplementation. Dry wts. of cells grown in medium containing ammonium sulfate as the nitrogen source were higher than the stillage-grown cells after 7 days of growth. The viscosity of the polysaccharide on day 7 was higher for cells grown on thin stillage rather than ammonium sulfate as a nitrogen source. The pullulan content of the polysaccharide elaborated by ammonium sulfate-grown cells on day 7 was higher than the pullulan content of polysaccharide produced by stillage-grown cells regardless of whether yeast extract was added to the culture medium.

L16 ANSWER 6 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1997:79218 CAPLUS
DOCUMENT NUMBER: 126:103133
TITLE: Medium optimization for pullulan production by Aureobasidium pullulans ICCF-83
AUTHOR(S): Moscovici, M.; Oniscu, C.; Ionescu, Corina; Fotea, Ortansa; Parvulescu, Paula; Hanganu, L.D.
CORPORATE SOURCE: Chemical Pharmaceutical Research Institute, Bucharest, 74373, Rom.

SOURCE: Roumanian Biotechnological Letters (1996), 1(3), 191-197
CODEN: RBLEFU; ISSN: 1224-5984
PUBLISHER: Bucharest University, Dep. of Enzymology and Biotechnology
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A two-step optimization study, including a fractional factorial plan based on a Hadamard's matrix followed by the maximum slope method, was accomplished on a pullulan production medium. Considering the six components of the culture medium, a fractional factorial plan containing 23 expts. was applied, leading to a linear model function. The concns. of the carbohydrate substrate and the nitrogen sources were the most important factors. The maximum slope method led to an optimized medium on which a final concentration of 71 g polysaccharide/L and a 71% substrate conversion yield were achieved.

L16 ANSWER 7 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1996:701239 CAPLUS
DOCUMENT NUMBER: 126:114891
TITLE: A pullulan-degrading enzyme activity of Aureobasidium pullulans
AUTHOR(S): West, Thomas P.; Strohfus, Beth
CORPORATE SOURCE: Department Chemistry Biochemistry, South Dakota State University, Brookings, SD, 57007, USA
SOURCE: Journal of Basic Microbiology (1996), 36(5), 377-380
CODEN: JBMIEQ; ISSN: 0233-111X
PUBLISHER: Akademie Verlag
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A pullulan-degrading enzyme activity was detected in the culture medium after growth of Aureobasidium pullulans on corn syrup as a carbon source. The product of pullulan catabolism by this activity was glucose. The highest specific activity of this enzyme was found after 7 days of fungal growth. Although α-amylase activity was not detectable, the presence of a glucoamylase activity was indicated. It appeared that the enzyme responsible for pullulan degradation was likely glucoamylase B.

L16 ANSWER 8 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1996:163723 CAPLUS
DOCUMENT NUMBER: 124:226218
TITLE: Polysaccharide production by sponge-immobilized cells of the fungus Aureobasidium pullulans
AUTHOR(S): West, T. P.; Strohfus, B. R.-H.
CORPORATE SOURCE: Department Chemistry and Biochemistry, South Dakota State University, Brookings, SD, 57007, USA
SOURCE: Letters in Applied Microbiology (1996), 22(2), 162-4
CODEN: LAMIE7; ISSN: 0266-8254
PUBLISHER: Blackwell
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Cells of the fungus Aureobasidium pullulans ATCC 42023 were immobilized in sponge cubes and examined for their ability to elaborate the polysaccharide pullulan in relation to carbon source. It was found that fungal cells grown on corn syrup, sucrose or glucose as a carbon source could be immobilized in sponge cubes and that comparable cell wts. and viable cell concns. were immobilized. Independent of the carbon source tested, the immobilized fungal cells could be used at least three times for the production of polysaccharide. The immobilized A. pullulans cells elaborated the highest polysaccharide levels in the culture medium after 5-7 days of growth at 30°.

L16 ANSWER 9 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1995:482158 CAPLUS
DOCUMENT NUMBER: 122:259435
TITLE: Purification and characterization of an alkaline amylopullulanase with both α-1,4 and α-1,6 hydrolytic activity from alkalophilic Bacillus sp. KSM-1378
AUTHOR(S): Ara, Katsutoshi; Saeki, Katsuhisa; Igarashi, Kazuaki; Takaiwa, Mikio; Uemura, Takaaki; Hagihara, Hiroshi; Kawai, Shuji; Ito, Susumu
CORPORATE SOURCE: Tochigi Research Laboratories of Kao Corporation, 2606 Akabane, Ichikai, Haga, Tochigi, 321-34, Japan
SOURCE: Biochimica et Biophysica Acta, General Subjects (1995), 1243(3), 315-24
CODEN: BBGSB3; ISSN: 0304-4165
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A novel alkaline amylopullulanase (I) produced by alkalophilic Bacillus sp. KSM-1378 was purified to an electrophoretically homogeneous state from the culture medium. Purified I was a glycoprotein with an apparent mol. weight of .apprx.210 kDa and a pI of 4.8. The N-terminal amino acid sequence was determined and it showed no homol. to the N-terminal regions of other I reported to date. I was able to attack specifically the α-1,6-linkages in pullulan to generate maltotriose as the major end product, as well as the α-1,4-linkages in amylose, amylopectin, and glycogen to generate various oligosaccharides. The pH and temperature optima for the pullulanase and α-amylase activities were pH 9.5 and 50° and pH 8.5 and 50°, resp. Both activities were strongly inhibited by well-characterized inhibitors, such as di-Et pyrocarbonate and N-bromosuccinimide. The pullulanase activity was specifically inactivated by Hg2+, α-cyclodextrin, and β-cyclodextrin, whereas the amylase activity was strongly inhibited by EDTA and EGTA, although the inhibition could be reversed by Ca2+. It was suggested that the single alkaline I protein has 2 different active sites, one for the cleavage of α-1,4-linked substrates and one for the cleavage of α-1,6-linked substrates.

L16 ANSWER 10 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1995:421842 CAPLUS
DOCUMENT NUMBER: 122:182978
TITLE: Pullulan elaboration and differentiation of the resting forms in Aureobasidium pullulans
AUTHOR(S): Simon, L.; Bouchet, B.; Caye-Vaugien, C.; Gallant, D. J.
CORPORATE SOURCE: Lab. de biologie vegetale et biotechnologie, Univ. de Nantes, Nantes, F 44072, Fr.
SOURCE: Canadian Journal of Microbiology (1995), 41(1), 35-45
CODEN: CJMIAZ; ISSN: 0008-4166
PUBLISHER: National Research Council of Canada
DOCUMENT TYPE: Journal
LANGUAGE: English

AB To identify the cellular forms that are responsible for the synthesis of pullulan produced by Aureobasidium pullulans, we performed cytochem. and ultrastructural localizations of glucan in the cellular forms of this microorganism (blastospores and resting forms). Growth conditions, cell populations, and pullulan production were studied concurrently. Our results are consistent with a model in which the resting forms (swollen cells and chlamydospores) might be primarily involved in this extracellular polysaccharide elaboration. At the cellular level, pullulan production could be the result of three main stages: (i) cell wall thickening and extracellular polysaccharide synthesis by the swollen cell, (ii) fibrillar arrangement of this polysaccharide into pullulan along a capsular network around the chlamydospore, and (iii) subcellular hydrolysis separating the capsule from the

periplasmic zone and consequently permitting the solubilization of pullulan in the culture medium. A melanization process in the outer layer of the cell wall and the capsule accompanies these patterns.

L16 ANSWER 11 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1995:400708 CAPLUS
DOCUMENT NUMBER: 122:185432
TITLE: Effect of complex nitrogen sources on pullulan production relative to carbon source
AUTHOR(S): Reed-Hamer, Beth; West, Thomas P.
CORPORATE SOURCE: Dep. Chem., Olson Biochem. Lab., South Dakota State Univ., Brookings, SD, 57007, USA
SOURCE: Microbios (1994), 80(323), 83-90
CODEN: MCBIA7; ISSN: 0026-2633
PUBLISHER: Faculty Press
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The effect of complex N sources, including tryptone, peptone, soytone, casamino acids, and corn steep liquor, on pullulan production by Aureobasidium pullulans ATCC 42023 was studied in a medium where sucrose or corn syrup served as the C source. Growth on soytone resulted in the highest level of pullulan production by ATCC 42023 independent of the C source utilized. In general, all the complex N sources examined increased pullulan production relative to (NH4)2SO4 for either sucrose- or corn syrup-grown cells. Cell wts. of ATCC 42023 grown on either C source were lower when the culture medium contained a complex N source instead of (NH4)2SO4. The pullulan content of the polysaccharide elaborated by sucrose-grown cells on day 5 was highest on soytone, peptone, or corn steep liquor. The pullulan content of the polysaccharide produced by corn syrup-grown cells on day 5 was highest on peptone. The lowest pullulan content of the polysaccharide synthesized by the fungus, using either C source, occurred after growth on casamino acids.

L16 ANSWER 12 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1995:342072 CAPLUS
DOCUMENT NUMBER: 123:4094
TITLE: Characterization and recovery of a bacterial amylase liberating maltotriose and maltose
AUTHOR(S): Hampel, W. A.; Hinteregger, C.; Latzko, F.; Stoellnberger, W.; Werner, L.
CORPORATE SOURCE: Institute for Biochemical Technology and Microbiology, University of Technology, Vienna, Austria
SOURCE: Biocatalysis (1994), 10(1-4), 123-30
CODEN: BIOCED; ISSN: 0886-4454
DOCUMENT TYPE: Journal
LANGUAGE: English
AB An amylase which produces maltotriose and maltose from starch as the main products was isolated from the culture filtrate of an Arthrobacter species showing the ability to lyse yeast cell walls. The enzyme was purified to almost complete homogeneity from the concentrated culture medium by acetone precipitation and gel chromatog. The enzyme (specific activity 70 U/mg protein) showed an IEP of 5.4, a pH optimum of 7.5 and a mol. weight of 48 kD. Its temperature optimum was 40-45°, and there was only low stability of enzyme solns. at room temperature Furthermore, enzyme activity was strongly inhibited by Hg2+. Di- and trisaccharides identified as maltose and maltotriose were exclusively formed in a molar ratio of 1:5 from soluble starch, amylopectin and amylose, and even 1:11 from glycogen; pullulan was not cleaved. A stable solid enzyme preparation was recovered by cross-flow ultrafiltration and spray-drying at air temperature of 65-72° with KCl added as a stabilizer.

L16 ANSWER 13 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1994:603432 CAPLUS
DOCUMENT NUMBER: 121:203432
TITLE: pullulanases of alkaline and broad pH range from a newly isolated alkalophilic Bacillus sp. S-1 and a Micrococcus sp. Y-1
AUTHOR(S): Kim, Cheorl Ho; Choi, Ho Il; Lee, Dae Sil
CORPORATE SOURCE: Genet. Eng. Res. Instit., KIST, Taejon, S. Korea
SOURCE: Journal of Industrial Microbiology (1993), 12(1), 48-57
CODEN: JIMIE7; ISSN: 0169-4146
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Two highly alkalophilic bacteria, and potent producers of alkaline pullulanase, were isolated from Korean soils. The 2 isolates, identified as Bacillus sp. S-1 and Micrococcus sp. Y-1, grew on starch under alkaline conditions and effectively secreted extracellular pullulanases. The 2 isolates were extremely alkalophilic since bacterial growth and enzyme production occurred at pH values in the range of 6.0-12.0 for Micrococcus sp. Y-1 and 6.0-10.0 for Bacillus sp. S-1. Both strains secreted enzymes that possessed amylolytic and pullulanolytic activities. Extracellular crude enzymes of both isolates gave maltotriose as the major product formed from soluble starch and pullulan hydrolysis. Compared to other alkalophilic microbes such as Micrococcus sp. (0.57 units/mL), Bacillus sp. KSM-1876 (0.56 units/mL), and Bacillus number 202-1 (1.89 units/mL), these isolates secreted extremely high concns. (7.0 units/mL for Bacillus sp. S-1 and 7.6 units/mL for Micrococcus sp. Y-1) of pullulanases in batch culture. The pullulanase activities from both strains were mostly found in the culture medium (85-90%). The extracellular enzymes of both bacteria were alkalophilic and moderately thermoactive; optimal activity was detected at pH 8.0-10.0 and 50-60°. Even at pH 12.0, 65% of original Y-1 pullulanase activity and 10% of S-1 pullulanase activity remained. The 2 newly isolated strains had broad pH ranges and moderate thermostability for their enzyme activities. These results strongly indicate that these new bacterial isolates have potential as producers of pullulanases for use in the starch industry.

L16 ANSWER 14 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:215477 CAPLUS
DOCUMENT NUMBER: 120:215477
TITLE: Fermentative manufacture of a high pullulan content product.
INVENTOR(S): Ozaki, Yoshihide; Nomura, Tatsuo; Miyake, Toshio
PATENT ASSIGNEE(S): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Japan
SOURCE: Eur. Pat. Appl., 19 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 586034	A2	19940309	EP 1993-301615	19930303
EP 586034	A3	19941214		
EP 586034	B1	20000830		
R: DE, FR, GB				
JP 06065302	A2	19940308	JP 1992-265285	19920820
JP 3232488	B2	20011126		
CA 2090953	AA	19940221	CA 1993-2090953	19930303
CA 2090953	C	20040413		
AU 9333978	A1	19940224	AU 1993-33978	19930304
AU 673151	B2	19961031		
US 5518902	A	19960521	US 1994-361548	19941222

PRIORITY APPLN. INFO.: JP 1992-265285 A 19920820
US 1993-57908 B3 19930507

AB A product, containing pullulan having an average mol. weight <250,000, is prepared by continuously cultivating a microorganism capable of producing pullulan, such as Aerobasidium pullulans, in a nutrient culture medium containing a 10-20 w/v% saccharide, while controlling the viscosity of the nutrient culture medium to <30 cP. The product can be used as a viscosity-imparting agent, coating agent, adhesive, formed product, food product, cosmetic, pharmaceutical, and material for agriculture, forestry, stock raising and paper processings, as well as for mining and manufacturing industries.

L16 ANSWER 15 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:186844 CAPLUS
DOCUMENT NUMBER: 120:186844
TITLE: Production of pure pullulan from the pigment-deficient isolate of Aureobasidium pullulans GM21
AUTHOR(S): Shin, Yong Chul; Gu, Bu Geum; Kim, Tae Un; Kim, Ki Seok
CORPORATE SOURCE: Dep. Microbiol., Gyeongsang Natl. Univ., Jinju, 660-701, S. Korea
SOURCE: Sanop Misaengmul Hakhoechi (1993), 21(5), 494-503
CODEN: SMHAEH; ISSN: 0257-2389
DOCUMENT TYPE: Journal
LANGUAGE: Korean

AB A fungal strain was isolated as a pullulan-producer from plant leaves and identified as A. pullulans GM21. With A. pullulans GM21, culture conditions were optimized for pullulan production and changes in the mol. weight of pullulan produced were investigated according to the culture conditions. Maximum conversion yield of pullulan (58-60%; 40.8-42 g/L) was obtained with 7% sucrose at 25°, initial pH 7.5 by the batch cultivation method either in Erlenmeyer flask or in jar fermentor. The mol. wts. of pullulan produced at initial pH 6.0 and 7.5 were 820,000 and 260,000, resp. Compared with a conventional pullulan producer, A. pullulans IFO4464, the isolate was unique in that it produces nearly pure pullulan in the culture medium without comtamination by melanin-like black pigment and acidic or other neutral polysaccharides and it produces pullulan with as high as 60% conversion yield.

L16 ANSWER 16 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:101522 CAPLUS
DOCUMENT NUMBER: 120:101522
TITLE: Effect of pH on pullulan production relative to carbon source and yeast extract composition of growth medium
AUTHOR(S): West, Thomas P.; Reed-Hamer, Beth
CORPORATE SOURCE: Dep. Chem., South Dakota State Univ., Brookings, SD, 57007, USA
SOURCE: Microbios (1993), 75(303), 75-82
CODEN: MCBIA7; ISSN: 0026-2633
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The effect of medium pH on pullulan synthesis by Aureobasidium pullulans ATCC 42023 was investigated. The pH of a phosphate-buffered minimal medium, in which either sucrose or corn syrup was added as a carbon source, varied from 2.0 to 7.5. In batch shake cultures, pullulan concentration was monitored over a period of 5 days at 30°. The lowest pullulan concentration was detected at pH 2.0 for both carbon sources in media which either contained or lacked yeast extract The level of pullulan found for either carbon source increased as the culture medium pH was elevated toward neutrality. The optimal initial pH of the medium differed with respect to the carbon source and to the presence of yeast extract The optimal pH for

pullulan elaboration by the fungus after growth on medium containing yeast extract and sucrose was 6.5. In the absence of yeast extract in the medium, the optimal initial pH decreased to 5.5. A broad pH optimum was found when ATCC 42023 was grown on a corn syrup-containing culture medium which was supplemented with yeast extract Fungal pullulan elaboration was optimal between pH 5.0 and 7.0 in this medium. In the absence of yeast extract, the optimal range for pullulan synthesis by A. pullulans decreased to between 3.5 and 5.0.

L16 ANSWER 17 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:27217 CAPLUS
DOCUMENT NUMBER: 120:27217
TITLE: Polysaccharide production by a reduced pigmentation mutant of the fungus Aureobasidium pullulans
AUTHOR(S): West, Thomas P.; Reed-Hamer, Beth
CORPORATE SOURCE: Dep. Chem., South Dakota State Univ., Brookings, SD, 57007, USA
SOURCE: FEMS Microbiology Letters (1993), 113(3), 345-9
CODEN: FMLED7; ISSN: 0378-1097
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A reduced pigmentation mutant was isolated from A. pullulans ATCC 42023 by chemical mutagenesis and was subsequently characterized. The pigment melanin was present not only in A. pullulans cells but also contaminated the elaborated polysaccharide and thus, was measured in both fractions. Cellular and polysaccharide melanin levels of the mutant strain were at least 11-fold and 18-fold reduced, resp., compared to its parent strain after 7 days of growth at 30° whether sucrose or glucose served as the carbon source in the culture medium.
Polysaccharide and cell dry weight levels of the mutant were very similar to those observed for the parent after growth on sucrose or glucose as the source of carbon over a period of 7 days at 30°. The pullulan content of the polysaccharide produced by the parent or mutant strain was lower for sucrose-grown cells than for glucose-grown cells. It was also noted that the pullulan content of the polysaccharide elaborated by the mutant strain was slightly higher than that of the polysaccharide produced by the parent strain after growth on either sucrose or glucose.

L16 ANSWER 18 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:3228 CAPLUS
DOCUMENT NUMBER: 120:3228
TITLE: Purification and characterization of an alkaline isoamylase from an alkalophilic strain of Bacillus
AUTHOR(S): Ara, Katsutoshi; Saeki, Katsuhisa; Ito, Susumu
CORPORATE SOURCE: Tochigi Res. Lab., Kao Corp., Tochigi, 321-34, Japan
SOURCE: Journal of General Microbiology (1993), 139(4), 781-6
CODEN: JGMIAN; ISSN: 0022-1287
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Alkaline isoamylase (glycogen 6-glucanohydrolase, EC 3.2.1.68) activity was detected in the culture medium of an alkalophilic strain of Bacillus sp., designated KSM-3309, which was isolated from a soil sample. This novel enzyme was purified to homogeneity from the culture filtrate by precipitation with ammonium sulfate, chromatog. on DEAE-cellulose and DEAE-Bio-Gel A, and gel filtration on Sephacryl S-200. The purified enzyme had a pH optimum of approx. 9.0, and displayed maximum catalytic activity at 55°C. The enzyme had a mol. mass of 65 kDa, as determined by both SDS-polyacrylamide gel electrophoresis and gel filtration on Sephacryl S-200. The isoelec. point was 4.2. This enzyme cleaved the branching points of both amylopectin and glycogen, and incubation of the enzyme with these glucans caused large increases in coloration of the iodine reagent. Amylose, pullulan and maltose were practically

insensitive to the enzyme. The enzyme activity was inhibited by Hg2+ ions and by N-bromosuccinimide, but the thiol inhibitors iodoacetate, 4-chloromercuribenzoate and N-ethylmaleimide had either no effect or a slightly inhibitor effect. β-Cyclodextrin, an inhibitor of pullulanase, was not inhibitory.

L16 ANSWER 19 OF 43 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:535136 CAPLUS
DOCUMENT NUMBER: 119:135136
TITLE: Amylolytic activity of Humicola sp
AUTHOR(S): Rodrigues de Oliveira, Alexandre; Ximenes, Eduardo de Aquino; Felix, Carlos Roberto
CORPORATE SOURCE: Dep. Biol. Cel., Univ. Brasilia, Brasilia, 70910, Brazil
SOURCE: Anais da Academia Brasileira de Ciencias (1991), 63(4), 409-14
CODEN: AABCAD; ISSN: 0001-3765
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The thermophilic and cellulolytic fungus Humicola sp. secretes amylase in the liquid culture medium. This activity is induced by starch, maltose and cellobiose. Glucose impairs accumulation of amylolytic activity in the culture medium. The enzyme hydrolyzes starch, maltose and pullulan to glucose as the end-product.

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L2             0 S PULLULAN? (P) CELLS (P) BACTERI? (P) W/W
L3             0 S PULLULAN? (P) CELLS (P) BACTERI? (P) "W/W"
L4             0 S PULLULAN? (P) CELLS (P) BACTERI? (P)%
L5             0 S PULLULAN? (P) CELLS (P) BACTERI? (P) VISCOS?
L6             0 S PULLULAN? (P) CELLS (P) BACTERI? (P)  COLIFORM
L7             2 S PULLULAN? (P) CELLS (P) BACTERI? (P)  WEIGHT?
L8             0 S PULLULAN (P) CELLS (P) BACTERI? (P)  WEIGHT?
L9            22 S PULLULAN (P) CELLS (P) BACTERI?
L10            7 S PULLULAN (P) CELLS (P) MW
L11            0 S PULLULAN (P) BACTER? (P) MW
L12           62 S PULLULAN (P) MW
L13           35 S PULLULAN (P) MW (P) %WT
L14         7060 S PULLULAN?
L15          788 S PULLULAN/TI
L16            0 S L15 AND %WT/TI
L17            0 S L15 AND MW/TI
L18           46 S L15 AND MOLECULAR/TI
L19            0 S L18 AND 5WT
L20           28 S L18 AND %WT
L21            0 S L18 AND %W/W
L22            0 S L18 AND "%(W/W)"
L23            0 S L18 AND "%W/W"
L24            0 S L18 AND "W/W"
L25           15 S L18 AND CONC?
L26            0 S L18 AND DISINFECT?
L27            0 S L18 AND BACTERIOSTAT?
L28            0 S L18 AND ETHANOOL?
L29            1 S L18 AND ETHANOL?
L30          105 S L15 AND MOLECULAR
L31            0 S L30 AND %W/W
L32            0 S L30 AND % W/W
L33            1 S L30 AND "% W/W"
L34            0 S L30 AND W/W
L35            1 S L30 AND "W/W"
L36          186 S L15 AND CONC?
L37           32 S L30 AND CONC?
L38            0 S L15 AND G/G
L39           26 S L15 AND MW
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L1            65 S PULLULAN? (P) CELLS (P) BACTERI?
L2             0 S PULLULAN? (P) CELLS (P) BACTERI? (P) W/W
L3             0 S PULLULAN? (P) CELLS (P) BACTERI? (P) "W/W"
L4             0 S PULLULAN? (P) CELLS (P) BACTERI? (P)%
L5             0 S PULLULAN? (P) CELLS (P) BACTERI? (P) VISCOS?
L6             0 S PULLULAN? (P) CELLS (P) BACTERI? (P)  COLIFORM
L7             2 S PULLULAN? (P) CELLS (P) BACTERI? (P)  WEIGHT?
L8             0 S PULLULAN (P) CELLS (P) BACTERI? (P)  WEIGHT?
L9            22 S PULLULAN (P) CELLS (P) BACTERI?
L10            7 S PULLULAN (P) CELLS (P) MW
L11            0 S PULLULAN (P) BACTER? (P) MW
L12           62 S PULLULAN (P) MW
L13           35 S PULLULAN (P) MW (P) %WT
L14         7060 S PULLULAN?
L15          788 S PULLULAN/TI
L16            0 S L15 AND %WT/TI
L17            0 S L15 AND MW/TI
L18           46 S L15 AND MOLECULAR/TI
L19            0 S L18 AND 5WT
L20           28 S L18 AND %WT
L21            0 S L18 AND %W/W
L22            0 S L18 AND "%(W/W)"
L23            0 S L18 AND "%W/W"
L24            0 S L18 AND "W/W"
L25           15 S L18 AND CONC?
L26            0 S L18 AND DISINFECT?
L27            0 S L18 AND BACTERIOSTAT?
L28            0 S L18 AND ETHANOOL?
L29            1 S L18 AND ETHANOL?
L30          105 S L15 AND MOLECULAR
L31            0 S L30 AND %W/W
L32            0 S L30 AND % W/W
L33            1 S L30 AND "% W/W"
L34            0 S L30 AND W/W
L35            1 S L30 AND "W/W"
L36          186 S L15 AND CONC?
L37           32 S L30 AND CONC?
L38            0 S L15 AND G/G
L39           26 S L15 AND MW
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